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SOUTHERN Flight

September, 1943
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Paul Laune

SEP 18 1943

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The plane's ability to fly low, land quickly almost anywhere and hide easily enables it to play an important part also in the Artillery, Cavalry and Infantry. It acts as a scout, directs troop movements, transports officer personnel and delivers messages.

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SEPTEMBER, 1943 VOL. XX, NO. 3

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Happy Landings

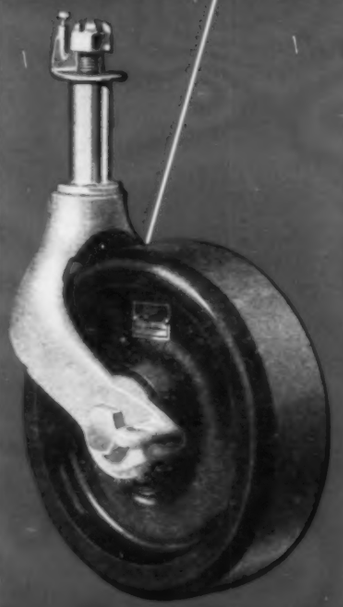
FOR GLIDER-BORNE TROOPS

The giant Commando gliders—newest "cogs" in our air forces' Victory machine—are effectively equipped with Scott Tail Wheel Assemblies to facilitate easier ground-handling—more ground maneuverability.

Developed by Scott specifically for glider installation, these special assemblies are patterned after the standard Scott Full Swivel design. Exceptionally light in weight, rugged and shock-resistant, these glider units are marked by an unusual production advantage: *no strategic war material is employed in their construction.* Even the tires are a special molded, composition in place of rubber!

Scott Aviation flies the Army-Navy "E" Flag for production achievement.

SCOTT *Full-Swivel* TAIL WHEEL ASSEMBLIES



And as another contribution to Victory joins the growing Scott family of air craft accessories and special equipment which now includes Oxygen Manifolds . . . Oxygen Regulators . . . Brake Pressure Units . . . Control Wheels . . . Stabilizer Yokes . . . Rudder Horns . . . Aileron Bell Cranks and 40-E *Scott-Cast* Aluminum Alloy Castings.

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The Birdmen's Perch

We're in love!

Lately we've done a heap of traveling. The Gulfhawk has left tire-prints on Army runways all over the country. And that's where we met this dream girl—at Army airports.

She's wonderful! . . . and her name is WAC.

At some busy Service fields she was in the tower and got us in with such crisp efficiency that we felt like the only plane in the area. At other fields she did the weather work—and when she said our destination would be "open" at our ETA, it *was* open. And once she fixed a sick oil pressure gauge in almost less time than it takes to write about it!

We knew that our dream girl was releasing men for combat duty. But at one base, the CO told us that on some jobs a Wac replaced *two or three men!*

We're awfully proud of our girl. And if you've a sister or daughter who wants to give a hand to winning the war, take our word for it, pilot—*she can't beat the WAC!*

Major Al Williams,

alias, "Tattered Wing Tips," Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh, Pa.

HE DIDN'T USE RADIO, EITHER—

When the only clock in his house (and the only timepiece he owned) ran down, a certain Perch Pilot didn't even say, "Pshaw." For Perch Pilots are made of Stern Stuff and have Pure Hearts to boot!

Instead, this bucko walked out to the local airport, sat around "flying the chair" a while, and returned home—where he set his clock correctly! Can you tell how?

We can. We will, in fact, if you ask us!

ABOUT EARDRUMS AND OILDRUMS

Have you ever asked ATC for approval of a flight plan change and heard this reply:

"CRASH ! ! ! ‡*?&*& BOOM ! ! TO CRUISE AT BANG!! CRACKLE #&** # GO AHEAD" . . .

Well, there's a gadget called the "radio static neutralizer" which private pilots will be able to get after the war (military fliers are getting them now) that eliminates static electricity from your reception . . . actually putting it to useful work.

We're not allowed to describe this "eliminator" very clearly—we can only tell you what it does. But we *can* tell you plenty about another "eliminator" . . . the Alchlor Process.

That's the method we use in refining Gulfpride Motor Oil, the world's finest motor oil. In effect, the Alchlor Process is an *extra* refining step which eliminates *more* of the carbon-making and sludge-forming molecules, and actually rearranges other molecules in Gulfpride to make them do more work.

Understand?

TNT FOR TWO

A war ago, nearly all the toluene (that's the last "T" in TNT) used in explosives came from the coal-tar industry.

But today a greater portion of the toluene for ordnance centers comes from the nation's oil refineries. And recently, Gulf put a brand-new unit into the production of toluene at the request of the Army Ordnance Dept.

This new unit, strategically located on the eastern seaboard, was constructed 100% with Gulf funds, too.

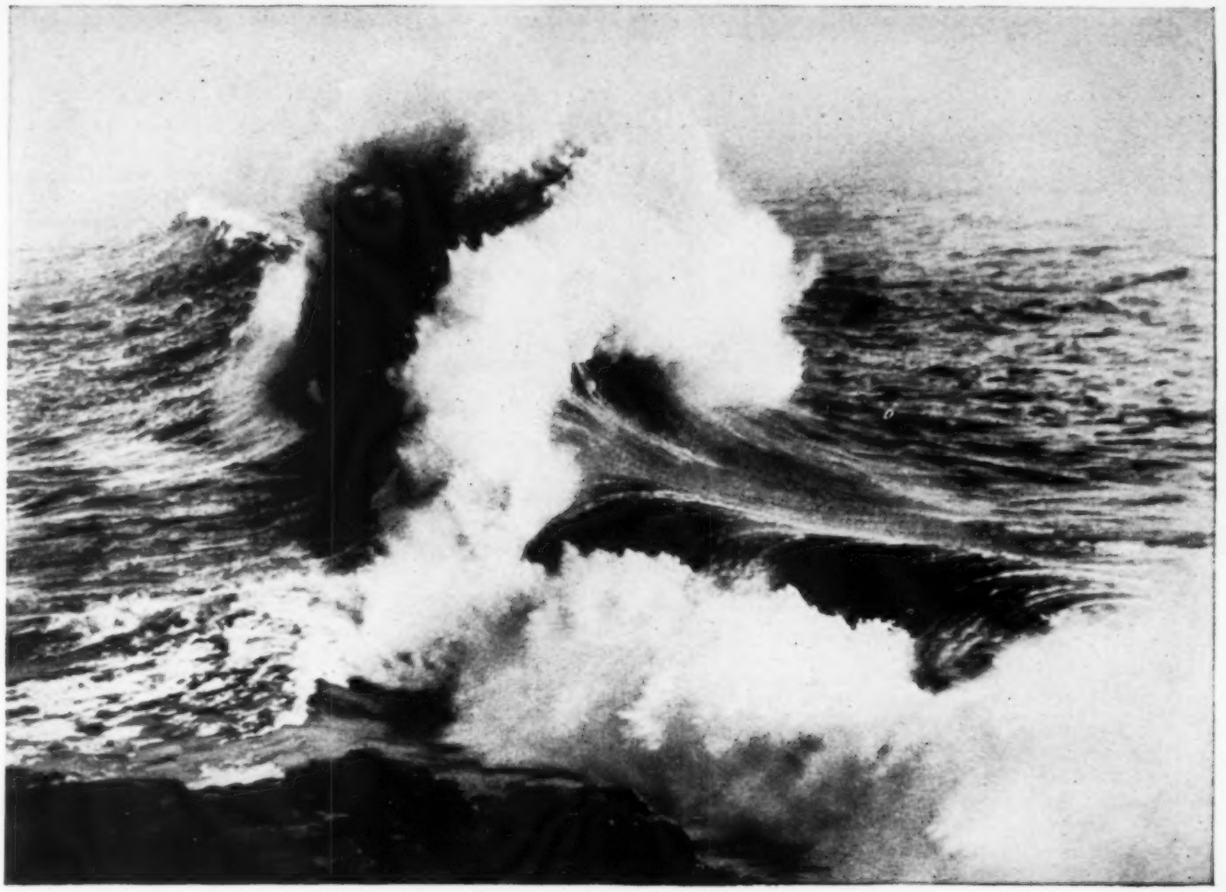
In short, Gulf has now gone into the business of making pre-fabricated bomb-holes for Berlin and Tokyo!

Gulf Oil Corporation and Gulf Refining Company...makers of

GULF AVIATION PRODUCTS

OIL IS AMMUNITION—USE IT WISELY

AN INACTIVE ENGINE COOLS QUICKLY IN FLIGHT-WHEN RESTARTING ENGINE IN FLIGHT,
WARM IT THOROUGHLY WITH THROTTLE ALMOST CLOSED BEFORE CRACKING THROTTLE OPEN···
KOFF!
JUST AS YOU WOULD ON THE GROUND-AND BE SURE YOU WARM UP-(AND OPERATE)-
WITH NOTHING BUT THAT GOOD GULF AVIATION GASOLINE!



This is the reason they called the tube KLYSTRON*

Does it seem far-fetched to you?

Can there be any possible similarity between an ocean wave and an ultra-high frequency tube?

As a matter of fact, there's a very definite similarity.

A breaking wave is the best way we know to picture what happens to electrons in the KLYSTRON tube invented by the Varian brothers—Russell and Sigurd—and Dr. William W. Hansen.

Inside this tube, the inventors were able to direct a stream of electrons which concentrated their power and released it much as waves do when they mount into crests and crash on the shore.

That's why the tube is called KLYSTRON. The name comes from a Greek word that denotes the breaking of waves on a beach.

Initial research on the KLYSTRON was done in California at Stanford University. The Sperry Gyroscope Company was quick to see the tube's possibilities. So they helped the inventors carry on further development of the KLYSTRON as a valuable tool of war and aeronautics.

When the tube got beyond the early experimental stages, the Varian brothers and Dr. Hansen joined Sperry's staff of inventors, engineers, and research men.

With the close co-operation of the Army and Navy, the development and perfection of the KLYSTRON continued, and is still continuing.

Applications of the KLYSTRON include the generation, amplification, and reception of ultra-high frequency waves. Naturally, they are being devoted exclusively to war uses at present.

When the war is won, Sperry research will explore the fascinating field of KLYSTRONICS** in relation to the comfort and security of a world at peace.

SPERRY

GYROSCOPE COMPANY, INC.

BROOKLYN, N. Y.

Division of the Sperry Corporation

*KLYSTRON is a registered trademark of the Sperry Gyroscope Company—Registration No. 371650.

**Trademark

JUST AMONG OURSELVES *Editorials and Comment*

The Shortage of Air Transportation

WE have reached the conclusion that too few persons, including those in Washington, realize the full importance of aviation planning. This was true before the war. It is even more apparent today. There is still too much talk, and not enough consideration of fundamentals.

America, faced with fighting a global war in the air, found its commercial air fleet with the small total of 350-odd air transports in 1942—three years after war had engulfed Europe. The military services were in even worse shape, and promptly took over all but a few of the airliners, leaving the operators without sufficient equipment to meet the vital and expanding demands of war industries and agencies.

There is one fact being overlooked by those who jump the Army for taking equipment away from the airlines. Its needs, as well as those of the operators, have been ignored by the politicians. In the middle 30's the GHQ Air Force hit upon the idea of air transport squadrons. Well we remember the first attempt at mobilizing such units. It netted a grand total of eight Douglases. They gathered at a pre-arranged base, coming in singly from Langley, Mitchell, Selfridge, March, Hamilton and Barksdale Fields. This was great stuff, and we published a write-up, with a photo, pointing to the need of more transports. So what happened? By 1942 the Army was still shy of transports, and the airlines had to be drained. Behind this was the same difficulty experienced in acquiring combat airplanes: Washington, primarily interested in politicking with work relief, food relief and other vague and so-called "social" reforms, just wasn't inclined to spend funds to equip the Army with the airplanes it had been begging.

If the Army had been allowed transport units when it needed them, its purchases would have benefited both the Army and the aviation industry. Army participation with the airlines in developing transport planes would have lowered the costs of development and production. By 1942 both the Army and the airlines would have possessed larger numbers of planes.

Instead of bursting forth with wild-sounding, destructive reports such as the Truman Committee's latest, Congress would do well to concentrate on constructive studies aimed at benefiting, not handicapping, the development of air services. After all, it was Congress which failed to provide adequately in the years of peace, and thereby caused many of today's most serious shortages plaguing aviation and the war effort.

Rehabilitating Veterans

EVERYBODY is talking about it and a few people are doing something about the business of helping our disabled veterans of World War II return to civil life and new occupations. In Texas, the State Department of Education, Vocational Division, is offering these veterans, at no cost to them, training in a line where their physical condition will not be a hindrance. Those interested in aviation ground work are enrolled in Dallas Aviation School, where, in 1939, Major W. F. (Bill) Long inaugurated courses open to disabled people in order that they might become self-supporting technicians. All of these students have gone into industry and their employe records are better than average.

To date 350 graduates of the twenty-four-week course are employed in aviation plants all over America. They can be found on the line and in the shops at North American, Lockheed, Consolidated, Douglas, Northwest Airlines, Braniff, Fifth Ferrying Command, Brady Aviation School, Perrin and Hicks Fields and Dallas Aero Service.

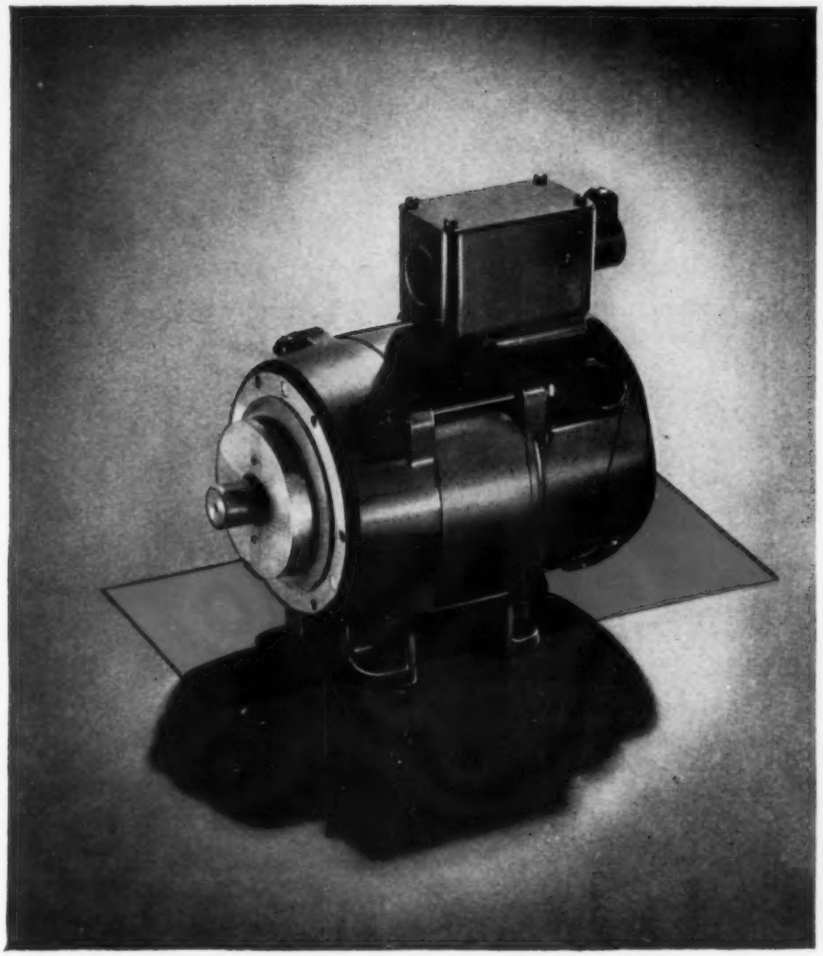
There should be an intensive national program to tackle immediately—before the war is over—the task of rehabilitating veterans from World War II. The facilities are already available in many areas, instituted before the war by planners like Major Long in Dallas. The need will be greater as the war is intensified.

Revving Up

ACCOMMODATING AMELICANS: **The day Washington announced our recapture of Kiska, we were having a session with some test pilots. One, who had spent seven years as a commercial North pilot, recalled how, in the summer of 1940, just a year before Pearl Harbor, he had flown a high Jap muckety-muck all over Alaska and the Aleutians. "He was interested in commercial fisheries," said our friend. "Whenever he wanted to go somewhere to look over a fishery, or a good fishing area, he'd come out to the plane, show me his U. S. credentials and off we'd go. He was especially interested in the Aleutians. He paid with a pad of papers, like requisition blanks, furnished him by the U. S., tearing one from the pad and scribbling his name on the dotted line. It was good as gold, too. If I remember correctly, it was signed by Harold L. Ickes."**

COMBAT BOX SCORE: According to an official month-by-month tabulation on Uncle Sam's eight air forces now in combat, those so-called "worthless" airplanes we've been fighting with have done right well. During the first half of 1943 the eight units destroyed 3,167 enemy planes in combat at a cost of 846. Let's see, now: that's an edge of about 3.74 to 1. (Chennault's 14th AF in China got 91 and lost 5, a ratio of 18.2 to 1.) Here's a breakdown of the totals, with our losses in parenthesis: NW African AF 1119 (402), 2.78 to 1; 8th AF United Kingdom 1091 (233), 4.68 to 1; 5th AF Australia 423 (71), 5.95 to 1; 9th AF Middle East 248 (65), 3.82 to 1; 13th AF So. Pacific 147 (49), 3 to 1; 14th AF China 91 (5), 18.2 to 1; 10th AF India 34 (15), 2.26 to 1; and 11th AF Alaska 14 (6), 2.33 to 1. More detailed accounts, showing enemy losses on the ground, as well as probables and those damaged, are contained in the following:

(Continued on page 14)



Dependable electric motors for aircraft

This Air Associates electric motor delivers 3 hp at 2,800 rpm . . . is specifically designed to operate a hydraulic pump used to feather and unfeather propellers. It is one of many lightweight, geared and direct drive types of electric motors for continuous or intermittent duty that Air Associates engineers and manufactures to Air Corps specifications . . . These motors operate hydraulic, fuel and anti-icer pumps; landing gear, flap and bomb door drives; gun turrets and other armament controls; tow target and anchor winch drives; fans, blowers and other types of motor driven aircraft devices . . . *Our present production schedules permit the acceptance of additional orders for delivery during the last quarter of 1943 through 1944.*

Air Associates, inc.

TETERBORO, N. J. . . . *BRANCHES:* CHICAGO, DALLAS, LOS ANGELES . . . ENGINEERS & MANUFACTURERS OF AIRCRAFT SPECIALTIES . . . SUPPLIERS OF ALL TYPES OF MATERIALS TO THE INDUSTRY SINCE 1927

BRILLIANCE WITH A PURPOSE

Like mirrors and jewels is the sparkle of polished metal parts in an Allison—but the eye cannot begin to see the perfection this brilliance reflects. ★ For one of the challenges in making aircraft engines is this... ★ To preserve—by exquisite accuracy of manufacture and finish—all of the inherent strength and endurance in every ounce of material used. ★ This need for perfection is nothing new to Allison. For years it has been our special province to handle metals with precision and lapidarian skill. ★ In today's tasks we are advantaged by all that General Motors has to offer in production techniques. ★ The result is a liquid-cooled aircraft engine which in performance can speak for itself — and an engine which we are resolved to make the finest in the world.

KEEP AMERICA STRONG
BUY MORE BONDS

POWERED BY ALLISON

P-38—Lightning
P-39—Airacobra
P-40—Warhawk
P-51—Mustang

LIQUID-COOLED AIRCRAFT ENGINES

Allison

DIVISION OF GM GENERAL MOTORS

Veterans of *Every* Battlesky

No other American-built fighters have fought so many battles, have downed so many enemy planes—over mountain, jungle, desert and sea—from the bleak Arctic to the blistering tropics—as have the Curtiss pursuits, veterans of the battleskies of World War II.

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Corporation
AIRPLANE DIVISION
BUFFALO • COLUMBUS • ST. LOUIS • LOUISVILLE

Member: Aircraft War Production Council, East Coast, Inc.

FIRST
Since the Birth of Aviation

CURTISS WARHAWK
LATEST OF A LINE OF FIGHTING HAWKS

It's Okay, Mom

We have this to say . . . to a lady whose boy has gone to war. All of us here in America want our fighting men to come back.

To help bring them safely home, we're giving them the best equipment we can produce. The finest of food, clothing, medicine, guns, tanks, planes.

That's why planes like the U. S. Army Bell Airacobra are designed with stout armorplate protecting the pilot . . . With self sealing gas tanks . . . With bullet-resistant "armor glass" . . . With a 37 mm. cannon in the nose. (After all, an explosive cannon shell hurtling at the enemy is a pretty good protective device!)

These and all the other safety features built into American planes add weight, make design problems tougher. But they'll bring safely home many an American boy who might not have come home without them.

WHEN they come home, they'll want planes of peace. There'll be another era of aircraft pioneering—this time to make planes still safer, simpler, more useful, more economical. You'll see then how an aircraft manufacturer could pack decades of aviation progress into a few short years of war. © Bell Aircraft Corporation, Buffalo and Niagara Falls, New York.

BELL *Aircraft*

AIRACOBRAS for victory—future planes for peace

38-2A **Morse Code** Credit 8 hours; learn to send and receive International Code at least 8 words a minute with buzzer and blinker.

1. Knowledge of code is fundamental to the communications phases of CAP missions. The sending and receiving of messages by dots and dashes not only plays an important part in operations such as Coastal Patrol but may prevent disaster in emergencies which may come in any community. Army planes have been saved by CAP members who flashed them landing direction with ordinary flashlights.

2. Examining the structure of the code will help fix it in your mind. Note how the 26 letters of the alphabet are assigned among 30 possible combinations. Logical arrangement according to brevity of signals would follow the order of frequency in which the letters are used in English: E, T, A, O, N, R, I, S, H, D, L, F, C, M, U, G, Y, P, W, B, V, K, X, J, Q, Z. The code approximates this sequence.

One at a Time		Two at a Time		Three at a Time		Four at a Time			
E	.	I	..	S	...	H	....	B	-...
T	-	A	.-	U	..-	V	...-	X	-..-
		N	-.	R	.-.	F	..-.	C	-.-.
		M	--	W	.--		..--	Y	-.--
				D	-..	L	.-..	Z	--..
				K	-.-		.-.-	Q	--.-
				G	--.	P	.--.		---.
				O	---	J	.---	Ch	----

3. The code can be memorized in less than an hour by associating a key word with each letter. This method is from an article by Benjamin Graham in ESQUIRE Magazine, March, 1942. Pretend that the dashes are consonants and the dots are vowels, including W and Y. Select words which begin with or contain each letter of the alphabet and in which the vowels and consonants occur in the same order as the dots and dashes for the respective letter. In some cases the key word will have to contain an extra letter in parenthesis to fit the code. Select your own words. The more absurd they are, the easier you can remember them. After you have learned the code thoroughly, the key words will slip from your mind and the dots and dashes will stay with you. Here is a sample set of key words:

A	.-	At	N	-.	No
B	-...	Beau	O	---	(O)dds
C	-.-.	Code	P	.--.	(P)oppy
D	-..	Day	Q	--.-	sQu(a)d
E	.	E	R	.-.	aRe
F	..-.	wiFe	S	...	(S)ooo
G	--.	Gnu	T	-	T
H	....	(H)owie	U	..-	U.a.l.
I	..	Ay	V	...-	(Victory)
J	.---	(J)umps	W	.--	W.p.b.
K	-.-	Keg	X	-..-	hoaX
L	.-..	aLee	Y	-.--	mYth
M	--	Md	Z	--..	(Z)zoo

4. Another way to memorize the code is by the following groups, useful in sending practice. Study of these groups will help you distinguish between letters of similar pattern.

5. After you are able to write the whole alphabet, practice with the dots and dashes in your spare time. As you go down the street, translate signs into Morse, thinking of a dash as "da" and a dot as "di". Repeating these syllables out loud approximates the sound of the letters on an oscillator. You can practice by whistling, rocking your foot, or tapping your fingers. Tap out letters at random. "Send" words from a book or magazine. Timing is as follows: a dash is as long as 3 dots; the interval between dots and dashes within a letter is as long as 1 dot; interval between letters, 3 dots; between words, 5 dots. By the above practice, you can soon learn to send much faster than the required 8 words a minute.

E	.	T	-	R	.-.	P	.--.
I	..	M	--	K	-.-	X	-..-
S	...	O	---	L	.-..	Y	-.--
H	....	G	--.	F	..-.	Q	--.-
A	.-	N	-.	U	..-	Z	--..
W	.--	D	-..	V	...-	C	-.-.
J	.---	B	-...				

7. **Duties of Command and Staff Officers** 2 hours Text: CAP Training Manual 32-7; CAP Rules 17.

1 Lectures. It is required that each member understand thoroughly the duties of the officers and non-commissioned officers of his unit and, in a general way, the duties of officers in higher CAP units and the further duties that are performed by Army officers of similar function. Learn names of local CAP officers.

8. **Leadership and Command** 3 hours Text: CAP Training Manual No. 5.

1 Lectures and study of text. This course covers principles which are fundamental to the operations of all military units.

9. **Military Correspondence** 2 hours Text: CAP Training Manual 32-9.

1 Learn thoroughly so as to be able to write military letters and endorsements in correct form without aid of text.

10. **Operations Orders** 1 hour Text: CAP Training Manual 32-10.

1 Learn to write orders in correct form without aid of text.

11. **Firearms** 6 hours Text: War Dept. Field Manual FM 23-26 GPO 15c.

1 In certain military operations of CAP, the carrying of pistols is necessary. At many airports, CAP members are performing guard duty with rifles, shotguns, pistols, or revolvers.

2 All members should become familiar with the mechanism, use, and safe carrying of these weapons, especially the pistol, and, if possible, with other weapons such as the Thompson sub-machine gun.

3 Target practice, at least with .22 calibre rifles and revolvers, is recommended where possible. Co-operation may be sought from nearby units of the Army, Navy, and State Guards, and from local police, schools, and rifle clubs for facilities and instruction.

4 Arms will be carried openly—without concealment. The Federal Government, the States, and many municipalities have laws and regulations as to the possession, carrying, and use of firearms. The inclusion of this course in the CAP training program must not be construed as granting permission to anyone to possess, carry, or use firearms except in strict compliance with law.

12. **Courts Martial** 6 hours Text: War Dept. Manual for Courts Martial GPO $1.

1 As in civilian life, a member of a military organization is entitled to a fair hearing when serious charges are brought against him. It is desirable that all CAP members gain a general understanding of the procedures, the legal terms in common usage, and the principal offenses for which punishment is necessary to maintain military discipline. A thorough study of the Manual will give good background as to the principles of law.

2 Required training will consist of a series of lectures, preferably by an attorney, and a mock court martial made as realistic as possible.

33- **Civilian Defense**

0. It is the duty of every CAP unit to prepare for local emergencies which may come through action of the enemy or of enemy agencies. In so preparing, the unit will be ready for natural disasters such as floods or tornadoes. It is the duty of each unit to learn defense techniques so that it will be able not only to work with the other protective agencies but to operate on its own where necessary.

1. **Local Civilian Defense Familiarization** 1 hour No Text: Instructors will get current information from appropriate local agencies.

1 Familiarize members with local civilian defense, police, fire, and first-aid agencies; the service they perform; where they are located; how they can be reached; and how the CAP unit may co-operate with them in emergency.

SAFEGUARDING MILITARY INFORMATION **Credit 1 hour**

CAP TRAINING MANUAL 32-3
March 29, 1943

1. The enemy is in search of information, some of which you may know without realizing its importance. A ship sailing here or a flight of planes there may be just the fact an enemy agent needs to complete his jig-saw puzzle of clues to our military operations. Think what that would have meant had the element of surprise been removed from our capture of French Africa. Loose talk, even about matters which are common knowledge locally, may cost many American lives by helping the enemy compile data which he can fit into a pattern. The loss or disclosure of military information is a serious offense, especially in wartime.

2. Civil Air Patrol has kept its secrets well. The work entrusted to it by the Armed Forces therefore has increased in scope and responsibility. It is the duty of every member to learn and observe the rules of military secrecy.

3. There are two types of military information: (a) **classified** information, which is either (1) secret, (2) confidential, or (3) restricted, as will be defined below; and (b) **unclassified** information which is available to the public. Because the press and radio operate under the Code of Wartime Practices of the U. S. Office of Censorship and are co-operating fully in withholding news that might help the enemy, you can be reasonably sure that it is proper to discuss most of the things that you read. But even then, unless it is evident that the information has been made public by proper authority, you may help the enemy by repeating and putting your own interpretation on some of the things you see in print.

4. War Department Circular 113, April 17, 1942, by order of the Secretary of War through the Chief of Staff, points out how information of value to the enemy may be published through ignorance of its significance with the result of defeating the purpose of the Code of Wartime Practices. The Circular sets forth what constitutes information of value to the enemy, in part, as follows:

A. **Factual information of our armed forces**—Such information includes the organization, composition, strength, state of training, equipment or armament of any unit; the morale of our armed forces; mutiny or sedition within a command; identification and location of units; assignment of personnel; the activation or contemplated activation of new units; the tactical employment for which units are organized or trained; tactical doctrines of our armed forces; the movement of troops within or without the United States; the assembly of units in a staging area or port of embarkation; weather reports; maps or photographs showing the detailed disposition of our forces at home or abroad; military operations contemplated or proposed, or information which might focus attention upon training, personnel, or equipment from which the character or location of future operations might be deduced; casualty lists; photographs or descriptions of damage to military objectives; and matters of similar nature.

B. **Factual information of our logistics**—Such information includes descriptions, photographs or maps of war industries or military installations, airfields, rail terminals, highway systems, or storage facilities; information of new designs of, or experiments with, weapons, equipment, or production machinery; information about war contracts, type of production, production schedules, dates of delivery; estimated supplies of strategic and critical materials or rate of production of any armament, equipment, or other material of war; information about movement, assembly, or storage of supplies or materials of war; and matters of similar nature.

C. **Information for propaganda use**—Information which may be used by the enemy for propaganda to affect the morale of our people or that of friendly, neutral, or enemy peoples.

D. **Strategic information** which would lead the enemy to an interpretation of our war plans or intelligence.

5. Basic regulations governing classified information are set forth in Army Regulations 380-5, from which most of the following has been taken. Classified information will be discussed only with military or civilian personnel having a legitimate interest therein. No person in the military service or employed by it is entitled to information solely by virtue of his position. Information will be entrusted only to those who need it in the performance of their official duties. Public or private discussion of classified information in the presence of unauthorized persons is strictly forbidden. Clerical and technical work on secret and confidential matters will be performed only by trustworthy persons. The 3 types of classified information are defined by AR 380-5, in part, as follows:

A. **Secret**—When disclosure might endanger national security, cause serious injury to the interest or prestige of the nation or any governmental activity, or would be of great advantage to a foreign nation. The dissemination of secret matter will be held to the absolute minimum. Information as to the contents or whereabouts of secret matter will be disclosed only to those persons whose duties require such knowledge. It is exclusively for the official use of the person to whom it is divulged or issued, who will be responsible for its safe custody and security. Its inviolability is the duty and responsibility of all persons having knowledge thereof, no matter how obtained.

B. **Confidential**—When disclosure, although not endangering the national security, might be prejudicial to the interest or prestige of the United States, a governmental activity, or an individual, or be of advantage to a foreign nation. Confidential military information will neither be discussed with nor disclosed to unauthorized persons. The contents or whereabouts of confidential documents, cryptographic devices, or material will be disclosed only to those persons in the Government service whose duties require that they have such knowledge and to such other persons of especial trust who must be informed. Those to whom confidential information is entrusted or disclosed are responsible for its safe custody and security.

C. **Restricted**—When information is for official use only, or when its disclosure should be limited for reasons of administrative privacy or denied the general public. The information contained in restricted documents and the essential characteristics of restricted material will not be communicated to the public or to the press, but may be given any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are co-operating in Government work.

6. Authority to classify military information is as follows:

A. **Secret**—Matters may be classified as secret only by the authority of the Secretary, Under Secretary, or an Assistant Secretary of War; the Chief of Staff or an Assistant Chief of Staff on the War Department General Staff; a chief of arm, service, or the National Guard Bureau; a general officer; the commanding officer of a depot, post, camp, or station; the commandant of a general or special service school; or a military attache.

B. **Confidential or Restricted**—Documents, development projects, technical data, and materiel may be classified as confidential or restricted by any commissioned officer.

7. It is important that military information be protected by classifying it in the proper category but over-classification is to be avoided. To label a document "Confidential" rather than "Restricted" may needlessly limit its use. In CAP correspondence, when there is some reason for privacy but when no matters of military confidence are involved, the label "Personal" will be sufficient.

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SERVING THE UNITED NATIONS' AIR FORCES

REVVING UP

(Continued from page 8)

Following is a month-by-month box score of United States Army Air Forces combat operations in theatres of operations for the first half of 1943:

	Enemy Losses in Aerial Combat			Enemy Losses On Ground			U. S. Aircraft Losses in
JANUARY		Prob-	Dam-		Prob-	Dam-	Aerial
8th AF United Kingdom	Lost 57	able 34	aged 22	Lost —	able —	aged —	Combat 15
U. S. Units,							
N. W. African AF	144	63	75	31	6	—	86
9th AF Middle East	11	8	7	—	—	—	5
5th AF Australia	151	55	41	6	7	3	9
13th AF So. Pacific	34	3	1	—	—	7	7
10th AF India	—	—	—	—	—	—	—
14th AF China	8	5	—	—	—	—	1
11th AF Alaska	—	—	1	—	—	—	—
Total	405	168	147	37	13	10	123
FEBRUARY							
8th AF United Kingdom	72	28	12	—	—	—	18
U. S. Units,							
N. W. African AF	128	37	73	6	3	—	78
9th AF Middle East	8	7	1	—	—	—	3
5th AF Australia	41	21	6	5	—	—	7
13th AF So. Pacific	26	1	1	—	—	—	17
10th AF India	16	14	2	6	—	—	—
14th AF China	—	—	—	18	1	—	—
11th AF Alaska	7	—	4	—	—	—	—
Total	298	108	99	35	4	—	123
MARCH							
8th AF United Kingdom	141	43	56	—	—	—	17
U. S. Units,							
N. W. African AF	143	50	86	24	10	—	46
9th AF Middle East	17	4	12	—	6	—	7
5th AF Australia	91	39	15	—	3	—	11
13th AF So. Pacific	4	—	—	—	5	—	—
10th AF India	8	4	17	1	—	—	4
14th AF China	—	—	—	—	—	—	—
11th AF Alaska	2	2	—	—	—	—	1
Total	406	142	186	25	24	—	86
APRIL							
8th AF United Kingdom	148	43	31	—	—	—	30
U. S. Units,							
N. W. African AF	318	84	126	118	2	56	60
9th AF Middle East	152	28	48	1	—	—	20
5th AF Australia	70	16	8	6	—	—	17
13th AF So. Pacific	17	—	—	—	—	—	12
10th AF India	1	2	7	—	—	—	1
14th AF China	16	13	—	—	—	—	—
11th AF Alaska	—	—	—	—	—	10	—
Total	722	186	220	125	2	66	140
MAY							
8th AF United Kingdom	348	127	172	—	—	—	70
U. S. Units,							
N. W. African AF	215	51	69	76	46	37	62
9th AF Middle East	20	10	14	9	—	10	28
5th AF Australia	29	10	10	4	4	3	8
13th AF So. Pacific	3	1	1	—	—	—	7
10th AF India	9	10	11	—	—	—	9
14th AF China	58	23	2	14	10	1	—
11th AF Alaska	5	7	—	1	—	—	5
Total	687	239	279	104	60	51	189
JUNE							
8th AF United Kingdom	325	96	157	—	—	—	83
U. S. Units,							
N. W. African AF	171	42	52	11	1	1	70
9th AF Middle East	40	23	8	8	—	—	2
5th AF Australia	41	4	2	3	6	—	19
13th AF So. Pacific	63	1	—	—	—	—	6
10th AF India	—	—	—	—	—	—	1
14th AF China	9	8	2	—	—	—	4
11th AF Alaska	—	—	—	—	—	—	—
Total	649	174	221	22	7	1	185
Grand Total	3167	1017	1152	348	110	128	846

The Columbia won every event in its class at the 1926 National Air Races. In 1927, Clarence Chamberlin flew it from Long Island to Germany. In 1930, Capt. Errol Boyd and Lt. Harry Conner flew it from Newfoundland to England.

4,000 MILES NON-STOP FLIGHT TO GERMANY

U. S. Army Air Forces Photo

This remarkable combat photo shows one of the unescorted B-17's in a fleet that rained destruction on the U-boat base and shops at Wilhelmshaven. Many of these powerful U. S. Army Eighth Air Force planes flew from America to England before they started their round-the-clock high level precision-bombing tasks over Germany.

Here is the answer to all Germans who thought America was "too far away." Had the Nazi leaders been a little brighter, they might have feared us sooner. Sixteen years ago, in 1927, a clear sign of American air prowess appeared in the German skies. It was the famous Bellanca long-distance cabin monoplane which flew over 4,000 miles to Germany in 42 hours and 45 minutes, non-stop, setting a world's record.

Today, the Bellanca tradition marches on in the production of the AT-21-BL gunnery crew trainer—precision-built armament equipment—and aircraft components for many of the United Nations bombers that are fighting for freedom in every theatre of this global war.

Above: at Kottbus, southeast of Berlin, where Pilot Chamberlin landed en route to Tempelhof Field, the Columbia gives this curious crowd something to think about. Below: the AT-21-BL gunnery crew trainer, now in production for the U. S. Army Air Forces.

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The "Lightnings" and the "Liberators" . . . the "Thunderbolts" and the "Wildcats" . . . the "Vengeances" . . . and many others, take to the air for their vital test flights with Shell Aviation Fuel in their tanks.

The engines, too, of many of these "stingers" are lubricated with AeroShell Oils. A significant fact, when you consider the kind of performance fuels and lubricants *must* deliver in order to survive the "test-battle" of the skies.

Preference for Shell Products also includes many aviation engine manufacturers, aviation training schools, transport lines and airports.

Farsighted airport operators will find Shell's wartime popularity a profitable peacetime asset.

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ARMY'S B-26 MARAUDER

THEY'RE WRITING HEADLINES WITH A

MARTIN MARAUDER

ALEX . . . JOE . . . STEVE . . . ED . . . and BILL. You know them. Alex, who used to bring your groceries . . . Joe . . . Steve . . . Ed and Bill, who used to go with little Sally Miller. Likeable, quick-to-laugh young Americans. Give them the best aerial schooling in the world, put them in a rocket-fast, Martin B-26 Marauder, and they're a flyin', fightin' team that wins!

There's a reason for this, of course. Aircraft are highly complicated mechanical devices . . . and these boys were fitting together gadgets, tinkering with tools, racing old jalopies, when their adversaries were learning to "heil" and "banzai." They've got the feel of speed, the mechanical know-how that makes natural pilots, gunners and bombardiers.

This same technical skill gives America fighting planes like the Martin B-26 Marauder. Sleek, graceful, packed with speed, power and punch, it's the kind of plane that makes young America's eyes light up . . . makes him say, "Put me down for the Air Force!"

BRITAIN'S BALTIMORE

What's more, American technical skill is going to play a major role in fashioning the future. Already Martin has designed giant airliners of 125 or more tons . . . mighty ships that will bring distant nations to within hours of your doorstep. At the same time, our Army and Navy airmen, imbued with the thrill of flight, the love of speed, are resolving never to be shackled to earth again. They're in the air . . . to stay!

Alex... Joe... Steve... Ed... and Bill.
They're doing more than win a war. They're building a world that will take your breath away.

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Martin AIRCRAFT

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THE FAST FREIGHT FLYS

Via WACO

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Much of this fast freight flys via WACO . . . yes, in a fleet of WACO standard, four-passenger, cabin planes converted to cargo service by Southwest Airways Company.

Carrying 1,000-pound payloads and logging 75,000 miles a month, these sturdy, pre-war WACOS have flown more than 100,000,000 pound miles without loss or damage in the first six months of operations . . . despite the rigors of eight daily flights in all kinds of weather over all kinds of terrain.

These ships were built in happier days to carry you and yours comfortably and care-free on your peace-time jaunts. Today, in performing war's grim missions, they are more than upholding WACO tradition for rugged, dependable performance . . . a tradition you can be sure will never die as long as WACO builds planes.

Converted Waco passenger models are used exclusively by Southwest Airways Co. in their feeder airline service which handles high priority and APOC shipments for the U. S. Army Air Forces. Waco's current war job is designing and building army cargo-transport gliders.

ALL ARMY CARGO-TRANSPORT GLIDERS ARE WACO DESIGNED

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THE KOLLSMAN ELECTRIC DUAL TACHOMETER AND SYNCHROSCOPE *not only registers engine revolutions in twin-engined planes, but directly compares the speed of the engines to permit perfect synchronization. It is electrically operated, with generators on the engines sending power impulses by wire to the indicators on the instrument panel.*

WHAT TOMORROW'S AIRCRAFT ENGINES *will look like or how they will perform, we don't know yet. But we do know that instruments will play a large part in expanding their scope and usefulness far beyond anything we know today. Kollsman engineers are constantly developing new and better aircraft instruments which will help widen and extend tomorrow's skyways for a new era in aviation.*

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PRESENT . . .

Report on Glider Transport

By TOM ASHLEY

NIGHT had fallen, and with it a blinding rain, when two Douglas C-47's lumbered across the North Carolina flats, their tails sagging beneath the weight of shimmering nylon ropes dragging heavily-laden cargo gliders behind them. Ahead and fifteen hundred feet below was refuge and the huge motorless transports were quick to cast off, banking lazily down through the torrent and rolling to a stop in front of Operations at Laurinburg-Maxton Army Air Base. Thirty-two minutes later the C-47's trundled down the runway and pulled up beside them.

Nobody paid much attention, for gliders were common in these parts. But for the sixteen officers and men who piled out of the craft this was a memorable occasion. Nine hours and forty-five minutes earlier, on July 18, 1943, they had taken off from Sheppard Field into Texas' wide blue yonder. They had covered a total of 1,243 miles — a world's record for nonstop cargo glider operations. It surpassed the feat announced on July 5 by the British after an RAF glider train flew 3,500 miles from Montreal to England across the North Atlantic, for the British had made intermediate stops for fuel and their longest nonstop hop had been only 1,177 miles.

But of greater importance to Uncle Sam's execution of the war, however, was the nature of the AAF flight — not its endurance. The two Ford-built CG-4A gliders and their tow planes had demonstrated the practicability of a hush-hush war innovation, projected by the combined plans of the Troop Carrier, Air Service and AAF Training Commands. Details cannot be disclosed, but from the crews' log we can obtain a few facts for a better understanding of cargo glider operations. For some time to come, this flight, and others now under preparation, will be studied not only by military planners but by air transport operators seeking postwar opportunities.

Poor Inter-plane Communications

At Sheppard Field, the gliders were loaded to capacity with sundry deadweight cargo and crew of four to each craft. Each item had to be moored

Officers mapping the AAF's recent 1243-mile nonstop glider cargo operation are, left to right, Capt. G. B. Ryan, Flight Officer D. E. Webb, Captain Edmond L. Brown, Major Ernest A. LaSalle, Lt. U. S. Algee and Lt. R. H. Ivey. (AAF Photo.)

securely to withstand rough air usually encountered in long-range flight, for loose cargo in a pitching glider can cause havoc. Once before a Jeep broke loose among the clouds and did more damage than the proverbial bull in a china shop. The C-47 tugs were loaded with extra fuel tanks, installed in the cabins. The take-off was uneventful for each train, although the tugs used 3,000 feet of runway instead of the usual 2,200 feet when towing empty gliders of the fifteen-place type. At cruising altitude, throttles were adjusted for the average speed at which the blunt-nosed gliders, with eighty-foot wings, operate most efficiently in tow.

South to Dallas, east to Shreveport and past the winding Mississippi, the two air trains soared on effortless wings. Up front in the tugs, the drag could hardly be felt. Back in the gliders the artificial flight was distinctly registering. Gliders are silent, except for the swish of airflow, only when sailing along at a slow clip of

(Continued on page 38)

Here's a block-to-block report on an epochal long-distance glider train flight, with an Army glider expert's view of future cargo possibilities. From the two you can draw interesting conclusions on the progressive development of motorless transports.

FUTURE . . .

By CAPTAIN EDMOND L. BROWN
Glider Unit, A-3 Division
Army Air Forces Training Command

A BRONZED veteran of the battle of Tokyo leaned against the railing around the observation deck of the Houston Air Terminal and watched the attendant activity of three small tractors each pulling a large sharp-nosed glider with graceful gull-like wings, loaded with passengers and freight, into place behind a whale-backed air transport which emitted faint blue clouds of exhaust from its diesel engines. Inside the air transport the communication officer checked the telephone connection of the three gliders as they hooked on and reported to the pilot that Flight Seventeen to Chicago via Dallas, Kansas City and Detroit was ready to take off. The co-pilot quickly checked the passengers in the luxurious air transport and warned the bridge players to close the windows to keep their cards from blowing and for the people standing at the bar to steady themselves until the ship cleared the runway.

An hour and a half later the telephone in glider number one rang and the transport pilot reported an altitude of two thousand feet, a wind velocity of twenty miles an hour with slight gust from 180°, and that the Dallas tower was holding runway seventeen open for the glider. The tow cable was released and quickly reeled into the tail of the air transport and the glider gracefully entered the landing pattern and landed on the first third of the runway by using flaps and spoilers, which cut the gliding ratio from fifteen-to-one to four-to-one. The glider barely came to a stop when a sturdy rubber-tired tractor hooked on and hauled the glider to the passenger terminal, where out stepped two dozen passengers and from the nose compartment, bags of mail and packages of express were removed. The same scene took place in Kansas City and Detroit. The air transport landed in Chicago and after several hours of unloading and refueling started again with three gliders on tow. At Detroit the glider was dropped and made a graceful landing, but instead of going on, the air transport circled the airport. What was wrong, motor trouble? No, the

transport with its two remaining gliders swooped over the airport at a hundred miles an hour and picked up another glider loaded with passengers bound for Houston.

The foregoing picture of postwar air transportation may sound like a modern Jules Verne tale. However, one would be surprised to know how close we are to the actual realization. In the postwar days it will be a rare sight to see a large passenger or freight airplane without one or more gliders in tow. A freight engine can carry little freight, but can pull many box cars; a river tug can carry but few bales of cotton, nevertheless, it can pull many barges. The same principle applies to glider transport. The airplane can pull much more than it can carry.

The Glider and Its Mission

The present CG-4A troop transport and cargo glider was designed for one purpose, and for that purpose it will do the job well, as the enemy will find out in due course. It is not very handsome compared with our sleek silver stallions of the air, neither is a mule handsome compared with a Kentucky thoroughbred. The Ford automobile of "Model T" days is not in the picture compared with the "V-8" of today. However, the mule can do a lot of dirty work and in the early twenties the "Model T" was one of the classiest cars on the road. The present CG-4A is not trim and graceful but is sturdy and will take a great deal of punishment. It looks and flies like a box car with wings.

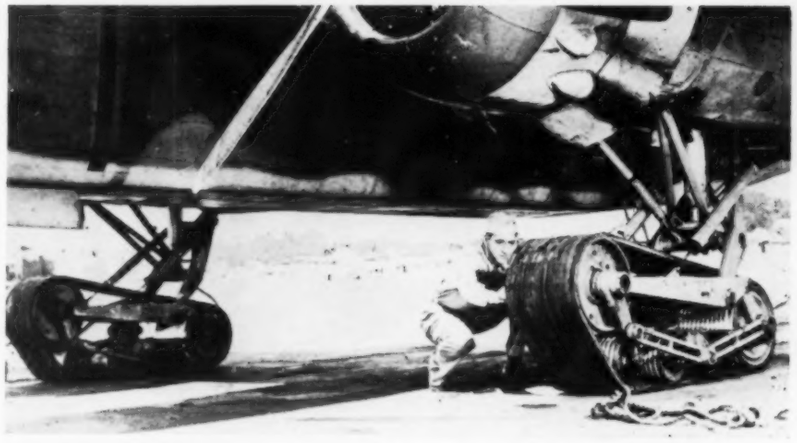
Even with box car nose drag the CG-4A can increase the cargo capacity of the present tow ship two tons with approximately twenty per cent increase in fuel consumption and two gliders behind a tow ship can increase the load four tons with approximately thirty per cent increase in fuel.

A glider streamlined with retractable landing gear should be able to carry as much as the tow plane with ten per cent increase in fuel.

A glider designed to do this performance should cost about one-third as much as the tow plane.

If the rate of progress of glider transport is the same in the postwar period as air transport was from Ford's tri-motor to the present swan-like silver birds of the air, we are in for many Jules Verne surprises.

One prevalent mistaken idea is that a glider is dangerous. Actually a glider is safer than an airplane. With the glider the fire hazard is practically nonexistent. With the large wingspread and light wing loading a glider can land slowly and even a crash landing seldom injures the passengers.



SUPER AIR TRANSPORTS using caterpillar landing gear will find conventional concrete runways or rough terrain to be practical, as the mechanism provides much lower contact pressure than wheels. Hub Industries, Inc. (formerly Dowty) of Long Island, N. Y., makes the gear under AAF contract. Attached to a Douglas A-20 (above), the gear is relatively light, gives four to eight times as much surface as tires, and will permit landing on rough terrain at speeds up to 120 m.p.h. Firestone engineers co-operated in perfecting the rubber belt tread and air springs for the lever suspension device.

While practicing landings over a fifty-foot tree, an Army glider came in too low and hit the tree smack in the top. Did it injure the people riding in the glider? No, it broke the tree down, knocked the wings off the glider, but the glider pilot and passengers brushed off the dust and walked away.

During glider maneuvers a glider pilot overshot the landing area and landed in a grove of pine trees. The wings were demolished and the glider roughed up a bit, but the fifteen men were out and shooting before the pine trees stopped groaning in protest.

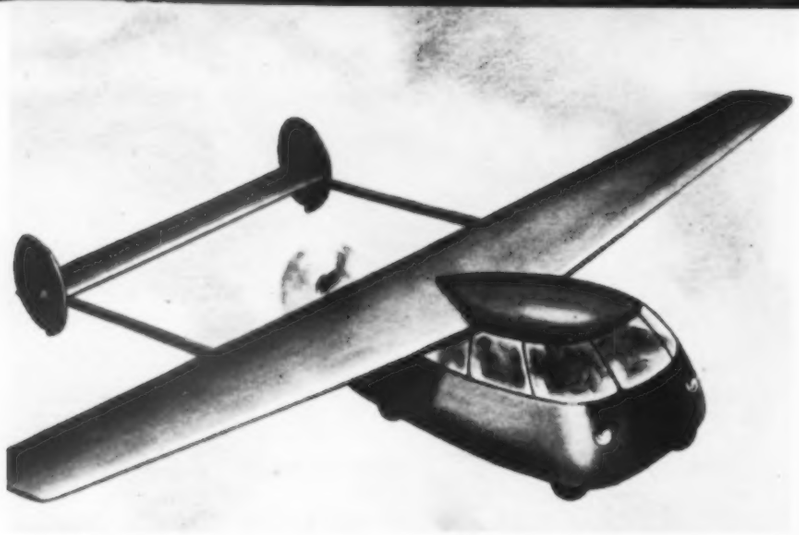
About Tow Planes

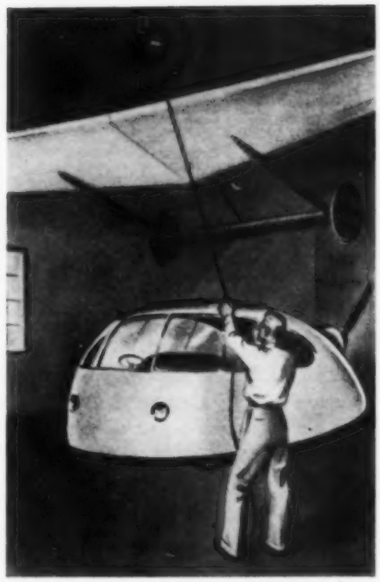
Speaking of tow planes, or tugs as they are commonly called, to date no airplane has been designed and built specifically as a glider tug transport. Tying a glider onto the tail of the ever-efficient Douglas C-47 or the trim Lockheed C-60 is like hitching a brewery dray behind a Kentucky stallion. These airplanes were not designed or built for glider tow work, but were drafted for the work because they were the most suitable robust fellows available. The C-47 nurses its cargo glider along like a patient mother hen leading her chicks to the barn. The C-60 is more impatient and is more like a greyhound with an unwelcome country cousin tied to its tail. The glider tug of tomorrow will be built strong and sturdy and will probably use diesel fuel. Instead of the tow rope being fastened to the tail to worry the pilot with every wind gust, it will be fastened near the center of gravity of the plane and will be so arranged that when the glider releases, the rope will be reeled into the cabin of the ship instead of being dropped on the airport with danger to life and limb. The tug transports while in flight will be able to pick up fully-loaded gliders.

What Makes a Glider Pilot?

There has been, and still is, a lot of conversation about what it takes to make a glider pilot. The answer is simple. It takes a good pilot. Any good airplane pilot can become a good glider pilot if his hands are mates. It is unfortunate that the CG-4A cargo glider looks so rough and wicked. Perhaps that is a good psychological point. Let's hope they scare hell out of the enemy. The average pilot has two strikes against him just by looking at the CG-4A. Without the throttle to correct mistaken judgment, a power pilot feels helpless. Once he gets over that fear and finds that the glider floats with the greatest of ease and can be landed in the next county if the airport is missed, he becomes downright interested. After landing a few times with two tons of cargo without breaking an egg he begins to have spots before his eyes and stays awake nights with visions of sky trains of the future. A glider pilot must have a thorough knowledge of the basic principles of flying and of airmanship. He must be a good meteorologist and have the resourcefulness that comes with a back-

(Continued on page 38)





Called the "Aerocar", this flying auto will be roadable without wings, with a ground speed of 70 m.p.h., and flyable with detachable combination wing and tail assembly with an air speed of 100 m.p.h., says Designer Stout. At right is his sketch of how the wing-tail assembly, stored in the garage, will be installed for flight.

Bill Stout Says . . .

YOU'LL be driving an "aerocar" a "roadable airplane" or a "helicab" not too many months after the war ends, is the prediction of W. B. Stout, head of Stout Research Division of Consolidated Vultee. Your aerocar, or flying automobile, will accommodate three passengers, take wings for week-end trips and will weigh 1,500 pounds, half the weight of the prewar Ford coupe. It will have a standard sixty-inch wheel tread and do sixty to seventy miles on the highway, on half the gas of your old car. The tires will be standard and its transparent body will enable you to see everything in sight, Stout declares.

For a flying trip, you back the car into a parking lot or garage, let down the combined wing and outrigger tail assembly and hook 'er on. The wing spread is thirty-five feet. A pusher prop is fastened at the rear of the body in order to obtain maximum vision in the air. You'll taxi across the parking lot runway, take off, and zoom across the countryside at 100 miles an hour, using about the same amount of gas as at sixty mph. on the ground. Your flying auto will be the first plane equipped with motor car arrangement on four wheels, and your cruising range will be about 250 miles. It will be a good auto first, an airplane second, Stout emphasizes.

But if you live in the West and have greater distances to travel, you will need a light roadable plane, weighing only 800 pounds and with a thirty-foot wingspread, which will take you on 400-mile cross-country hops. This roadable plane is primarily an airplane, just as the aerocar is primarily an automobile. In your roadable plane you'll do two miles a minute in the air, but only about thirty-five mph. on land. When you land, you fold the wings to make road travel possible. If the weather is bad, you'll continue your way by road.

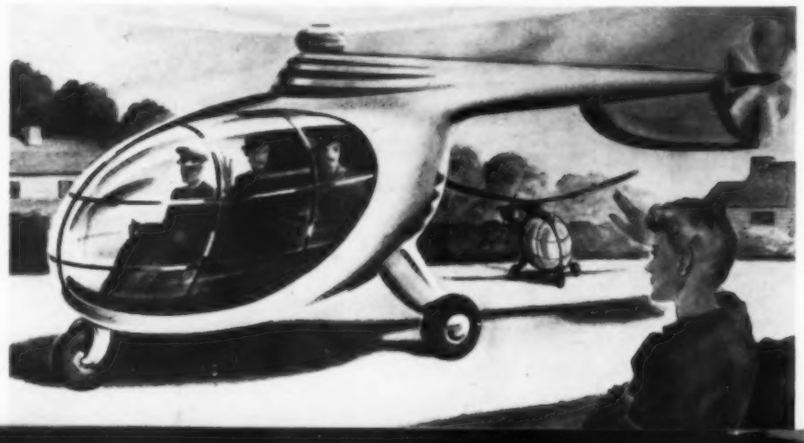
For the Eastern city dweller, creeping about congested streets, Stout recommends the helicab, the closest thing to personal wings yet devised. It will stand still in the air, hover at an aerial intersection, and need nothing bigger than a tennis court to land on.

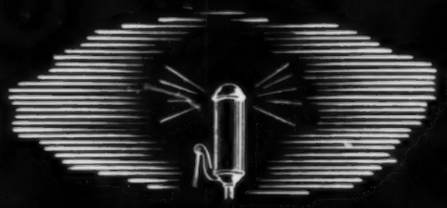
The helicab will be about twenty-five feet long and six feet wide and will stand eight feet high. A horizontal rotor on top of the plane will have

(Continued on page 54)

Here's Designer Stout in his Consolidated Vultee laboratory, with a scale model of his Aerocar. At right is the Stout "Helicab", powered with a 125-h. p. motor. The main rotor will have a 33-ft. spread, and a 6-ft. vertical tail propeller will correct torque from the large blade.

—(Consolidated Vultee Photos.)





Dare We Speak of Peace?

Yes—because it means so much to all of us individually. With it will come again those products of industry like the car, the radio and the refrigerator, which never were luxuries so much as necessities. And those who are thinking in post-war terms are asked to remember that Weatherhead will be prepared to help build these products again as well as the many strange new ones destined to emerge from this war.

Look Ahead with

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO
Manufacturers of vital parts for the automotive, aviation, refrigeration and other key industries.

Plants: Cleveland, Columbia City, Ind., Los Angeles
Canada—St. Thomas, Ontario

AIR transportation has gone to war. It is not generally appreciated how completely it has done this. As one of our important national assets, it had to do so. From the possessor of many talents, much is expected. The war is our first and indispensable job. Nothing else matters today. And every American must do his modern soldier's duty wherever he may be in order to hasten the unconditional surrender of our enemies. I am convinced that Americans generally are doing just that.

Looking ahead confidently, but calmly, the CAB Chief expects air cargo to receive great impetus from modern merchandising. The speed and utility of postwar air shipping will be the determining factor.

MERCHANDISING *by Air*

American Airlines in August inaugurated the nation's first transcontinental all-cargo schedules. One trip each way is now flown daily between Los Angeles and New York via Dallas.

In war, air transportation has been yanked out of its humble beginnings and made a world-wide star overnight. It can take it. In one limited field alone, the Air Transport Command has jumped a relatively small business into a big war cargo transportation business in one of history's twinklings, and we have not yet begun to fly our best. What of this air cargo experience will we carry over into the future?

Air cargo carriage was, before the war, largely a by-product of the other services of the air carriers. For years the air cargo rates were in excess of eighty cents a ton-mile. Freight is carried by rail in less-than-carload shipments at an approximate average rate of 3.29 cents a ton-mile with some individual rates going considerably higher. Trucking rates average nearly 4 cents a ton-mile. Rates for carload shipments by rail are less than one cent a ton-mile, and the cost of ocean shipping is considerably less than that. Air express rates were by many times the highest for any cargo transportation service in the United States. Prior to the war, only brief experiments had been made with the exclusive carriage of cargo, and no attempt had been made by reducing express rates to fill the large amount of idle capacity existing on passenger and mail planes.

In 1941, the grand average load factor of our domestic airlines was approximately 60 per cent. Less than 2 per cent of the load actually carried consisted of express. The total idle capacity flown by the domestic air transport system during 1941 was approximately 74,000,000,000 pound-miles. This compared with performance of about 10,500,000,000 pound-miles of express. Of course, this should not imply that all idle capacity could have been utilized by air cargo. Perhaps under normal conditions an average load equal to 75 per cent of the total possible load represents a maximum which cannot be exceeded without cutting the service to the public below reasonable adequacy on the more heavily loaded schedules. Time of dispatch of express also affects the ability to utilize idle capacity. But there was, and there will be again, space which lower rates can help to fill.

A pilot must keep turning his head and looking around. This is symbolic of the alert attitude which the air carrier organizations generally must continue to show. If the memory of early difficulties in the passenger and mail business may be retained in mind as object lessons, we can now give some appropriate attention to air cargo.

By L. WELCH POGUE
Chairman, Civil Aeronautics Board

The interest of the airlines in air cargo and its development must be keen. I believe that it is.

The stimulated war economy has produced an unprecedented growth in air express. In the last twelve months nearly 30,000,000,000 pound-miles of air express were carried on our domestic commercial airline services operating with only about one-half the pre-war equipment. Shippers are becoming acquainted with the advantages of shipping by air and there is being built up a backlog of popular demand for air cargo services which will have to be met in full at the close of the war. The war laboratory is producing specially-designed cargo planes for the carriage of cargo. The now cargo-conscious air carriers have recently taken the progressive step of reducing their rates by about 10 or 11 per cent, thus reducing shipping costs to the public on the basis of present volume by approximately a million dollars a year. Collectively and individually, they are looking into the possibilities of cargo carriage by air. This combi-

nation of aircraft availability, shipper demand, and air carrier initiative promises to place air cargo in its rightful place in air carrier economy. I should not be surprised if at some time in the future the revenue received by the air carriers from the carriage of cargo were to exceed the combined revenue now paid by passengers and mail.

Rates Aren't Only Comparison

This development will take place as a result of the operation of fundamental economic principles. Services which make money have a habit of becoming popular. Transportation which creates new markets and stimulates old markets to new activity will grow despite all efforts which might be made to restrain it. Air cargo will make these contributions.

It is a trade expression in the shipping industry that transportation is "50 per cent reciprocity and 50 per cent service." I am confident that the air carriers will take care of the reciprocity and friendship. They will take care of the services, too, and I should like to say something of those services of air transportation which will sell air cargo—of merchandising by air.

The first thing to be considered in determining whether or not to ship cargo by air is the out-of-pocket cost as compared with what it would cost to ship some other way. Obviously you don't compare these costs unless you are talking about some article which can be shipped by air. Equally obvious, air transportation is not going to run the railroads or the steamship lines out of business. Airplanes aren't going to be hauling coal in large bulk, for example, for sometime to come, if ever. As a matter of fact, I am one of those who believes that the tempo of air transportation and the enlargement of markets made available by it may well increase the heavy transportation business of our railroads. It isn't solely a question of cutting a pie and dividing it; it may also be a question of making available more pie.

The rates, however, are not the only things to compare. There are numerous other factors to consider in determining whether or not to ship this or that kind of cargo by air, each of which affects the pocketbook and all of which taken together may make what otherwise seems to be a high rate not so high after all. I will discuss some of these other factors in a moment. These factors are some of the things which require consideration when thinking about "merchandising by air." Air express rates in the past have been too high. While we are not in a position at the present time to say that they will be such and such in the future, we do know, beyond any question of a doubt, that they are coming down and they are coming down drastically. The passenger and mail planes of the future will not only have lower operating costs but greater passenger revenue-producing facilities. Thus will idle cargo capacity give opportunity for lower costs. We know also that there are being developed exclusive air cargo planes, devoid of the requirements of passenger planes, designed wholly for the business of hauling cargo, and we know that the cost for the operation of those planes is going to be less than that of present planes. If air transportation today can develop nearly thirty billion pound-miles of express at a rate of eighty cents a ton-mile, I believe it is clear that a rate of thirty, then twenty, then possibly fifteen cents a ton-mile will develop air cargo to a point where the most sanguine enthusiast for air transportation will take pride in describing its volume in terms of ton-miles.

I believe this because I feel that we are in error if we do not recognize that the economic feasibility of the carriage of cargo by air derives not only from the lower operating costs which will be a reality at the close of the war but also from the savings which will accrue to the manufacturer and to the consumer alike from the speedier transportation by air of commodities. "Time is money" is a well-worn adage but it is true, and air transportation saves time.

Many Kinds of Air Cargo

We may look only briefly to the past for indications of what the future may hold in the way of merchandising by air. In both the foreign and domestic fields, the air cargo service, as well as having what we have already noted as an excessively high rate, was comparatively new. In the international field, it had scarcely been established in some parts of the world when war broke out and forced its discontinuance.

Nevertheless, even before the war there were probably few articles of commerce which had not at some time or place been carried by air. In this country the principal commodities in air cargo were wearing apparel, newspapers, machinery, moving picture

(Continued on page 30)

RECOOPERING BOOSTS PAYLOADS

Pan American Airways handlers at Treasure Island, California, receiving air shipments bound for transpacific points, recently came across a seven-pound wooden case containing a delicate electrical device weighing one ounce. Faced with an overload in space and weight, they dismantled the bulky packing case and repacked the little gadget in a cotton-lined cardboard box the size of a pack of cigarettes.

Result: Several cubic feet of space and over six and one-half pounds of weight saved for other vital shipments.

On another occasion, a single shipment of seventy-seven pieces weighing 11,802 pounds arrived within six hours of Clipper time. The air-wise handlers worked at high speed over this one, succeeded in transposing it into 199 smaller pieces weighing only 8,930 pounds.

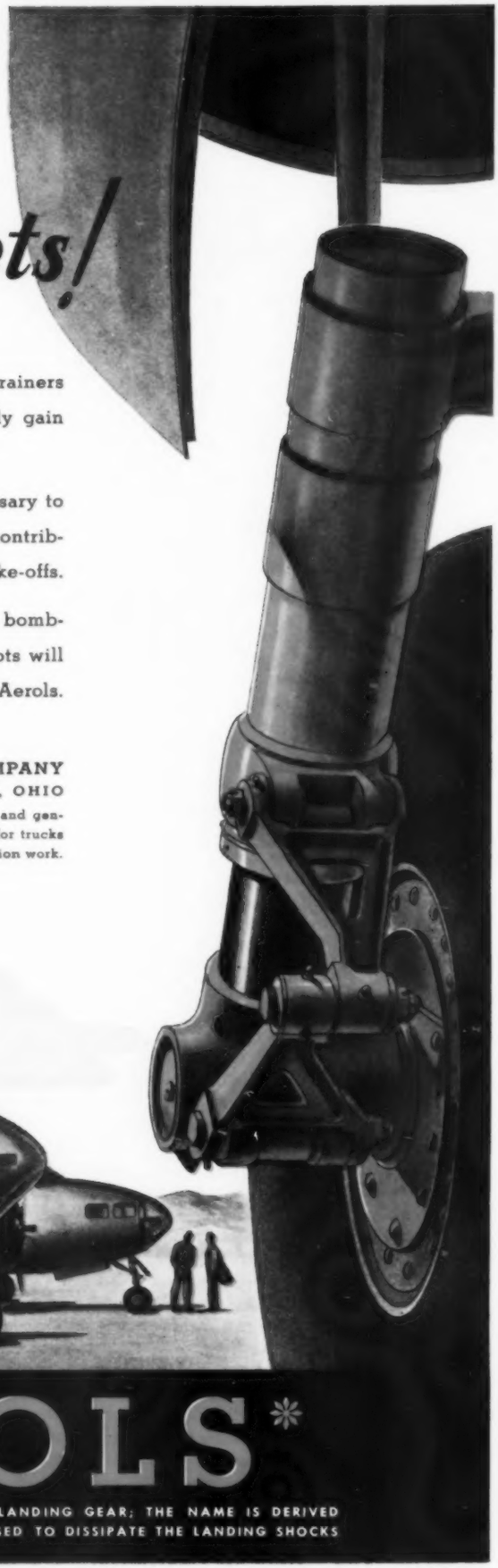
Result: The Clipper took on additional shipments totalling 2,872 pounds which otherwise would have waited at Treasure Island for the next schedule.

Then there was the time a dozen airplane wing tips arrived at Treasure Island for air shipment overseas, each solidly packed separately into a crate weighing 825 pounds. When the weight robbers were through with these, there were a dozen neat, safely-packed cartons weighing only 110 pounds each—a total saving of 7,128 pounds.

Such recoopering—the substitution of lightweight cardboard cartons for weight-and-space-consuming wooden cratings—is adding greatly to the air tonnage of Pan American overseas operations. In fact, the savings in June amounted to nine Clipper cargo loads—27,453 pounds. Since recoopering was inaugurated by PAA at the start of the war, total weight saving on transpacific loadings had reached 134,102 pounds on July 1, 1943. Total weight of air shipments has been cut 29 per cent.

Shippers accustomed to crating for rough handling aboard boats, trucks and trains will profit greatly by packing articles lightly, but securely, for air shipment.

"Legs" for Eaglets!



● Flying these Fairchild "Gunner" crew trainers equipped with Aerols, fledgling pilots rapidly gain confidence in their "landing legs."

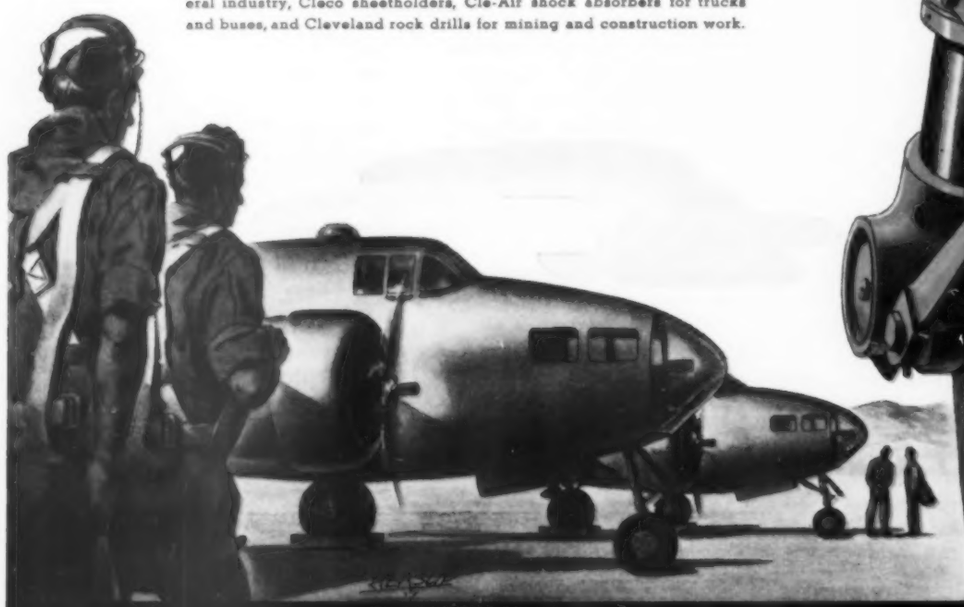
Aerols help these pilots gain the skill necessary to become formidable war birds because they contribute to safe, smooth landings and swift, sure take-offs.

When they advance to combat service—flying bombers, fighters and transports—these trainer pilots will again benefit by the matchless performance of Aerols.

●

THE CLEVELAND PNEUMATIC TOOL COMPANY
AIRCRAFT DIVISION • • **CLEVELAND, OHIO**

Also Manufacturers of Cleco pneumatic tools for the aircraft and general industry, Cleco sheetholders, Cle-Air shock absorbers for trucks and buses, and Cleveland rock drills for mining and construction work.



AEROLS*

*THE SHOCK ABSORBING UNITS ON AN AIRPLANE'S LANDING GEAR; THE NAME IS DERIVED FROM THE WORDS "AIR" AND "OIL"—THE FLUIDS USED TO DISSIPATE THE LANDING SHOCKS

POLICE POWER FOR *Peace...*

Down the sea of centuries man has sailed the ship of his dreams in pursuit of the pathway to peace. Perhaps his dreams may soon bear fruit. For the hope of a police power for world peace may yet become a reality at the close of the present conflict. In the struggle for the attainment of that aim, America pays tribute to the tireless efforts of every man and woman engaged in aircraft. For it is THEY who produce the power so essential to police the future peace.

ROMEC PUMP COMPANY • ELYRIA, OHIO, U. S. A.

Manufacturers of Aircraft Pumps and Accessories

FIRST IN DEPENDABILITY **Romec**

BUY WAR BONDS

A NEWLY DESIGNED CARGO AIRPLANE, incorporating within the fuselage ramps and winches for handling aerial freight, has been patented by William D. van Zelm of the Glenn L. Martin engineering department and assigned to the Martin Company. The four-engine version has a gross weight of 86,000 pounds, of which 13½ tons would be cargo. The two-engine version has a gross weight of 60,000 pounds. The tail surfaces are independent of the fuselage and attached to booms running out from the wings. The after end of the fuselage opens like a door to permit easy loading. The same hydraulic mechanism used to raise the cargo door extends a collapsible loading ramp.

MERCHANDISING BY AIR

(Continued from page 27)

films, advertising, auto supplies, electrical products, valuable papers, and electrotypes. Because of reduced insurance and interest rates a valuable market for air transportation had been established in the shipment of gold and precious jewels. Style goods were also carried by air to a very large extent. Here and elsewhere in the world planes have also carried horses, bulls, mining equipment, tractors, motor boats, wheat, and even lumber and coal.

While before the war air express shipments typically possessed high value of perishability, the lower costs and more widespread use of air cargo in the future will reduce the average value and the perishability characteristics of an increasingly large number of commodities which will be shipped by air. I do not mean by this to imply that eventually all commodities will be shipped by air. As I have indicated, so far as I can see into the future, I do not believe this would ever be economically feasible. I believe that air cargo will place in the channels of trade new articles of commerce and that, offsetting any diversions of present traffic which air transportation will achieve, will be the quickened economy that will produce compensating business for our surface transport system.

With this in mind, let us turn to the future. Large savings of time are gained through the use of air transportation. Perhaps its most striking savings will be reflected in the reduction of travel time in the field of international transportation. A shipment which in the old days might have gone by common practice first by rail to a coastal shipping point, there to be trans-shipped by sea to a port in China and trans-shipped there by rail to Chungking, may, so far as aircraft operational features are concerned, take wings and fly directly without trans-shipment from one of our metropolitan centers to Chungking in a matter of three days or so compared with something like at least five or six weeks by surface transportation. Even in our own country, however, the contraction of our borders from days to hours apart is significant. In the period following the war, schedules over the great trunk-line services will multiply and the extension of the benefits of air transportation to the small communities of the United States will offer to air cargo the opportunity to serve practically the entire country by air. The realization of these possibilities will step up the tempo of our entire national and international economy.

In order to develop the expanding markets of this nation in a world at peace we will want to send our businessmen and our products over the globe. Air transportation will permit us to do this with the competitive promptness which means the difference between success and failure in world markets. It will be no more unusual for the salesman of the future to take one of the daily services across the Atlantic and spend a week in canvassing Europe than it was recently for the salesman to take his automobile and spend a week in canvassing the provincial markets of a county. Our friends in China and Russia and our good neighbors to the south may expect to see our salesmen in weekly or monthly routine visits, just as we may expect to see their salesmen in this country. On the planes which will carry them will be mail and cargo, at first perhaps the samples of their wares. Then there will follow many of the filled orders for the wares themselves, many by rail and boat, some by air.

These things illustrate the quickness which the salesman and his product can be transported throughout the nation and the world. Speed is definitely an attraction to the shipment of commodities.

Less Packing for Articles

In both the domestic and international fields, the marketing of food with the speed of air transportation holds out certain opportunities for air cargo. The experiments and developments in the dehydration of food during the present war promises concentrated and highly valuable cargo for air in the future. Shipments of perishables in the vast expanses of our own country constitute an important transportation activity. In the air cargo future of our nation many of these perishables may be shipped by air with a speed which, coupled with the reduction in refrigeration costs and the improved quality of the product on the market, may result in their volume shipment by air. The speed of the airplane will also establish, so far as the element of time in shipment is concerned, a foreign market for perishables as close as and closer than our domestic market by surface transport.

In international shipping practice, shipping by air will lessen the necessity of trans-shipment which I have already mentioned. Air cargo holds promise of playing an important part in reducing the comparative cost of air transportation with other forms of shipping. The handling costs attendant upon trans-shipping may be eliminated when shipping by air. Further, air cargo can reach places where

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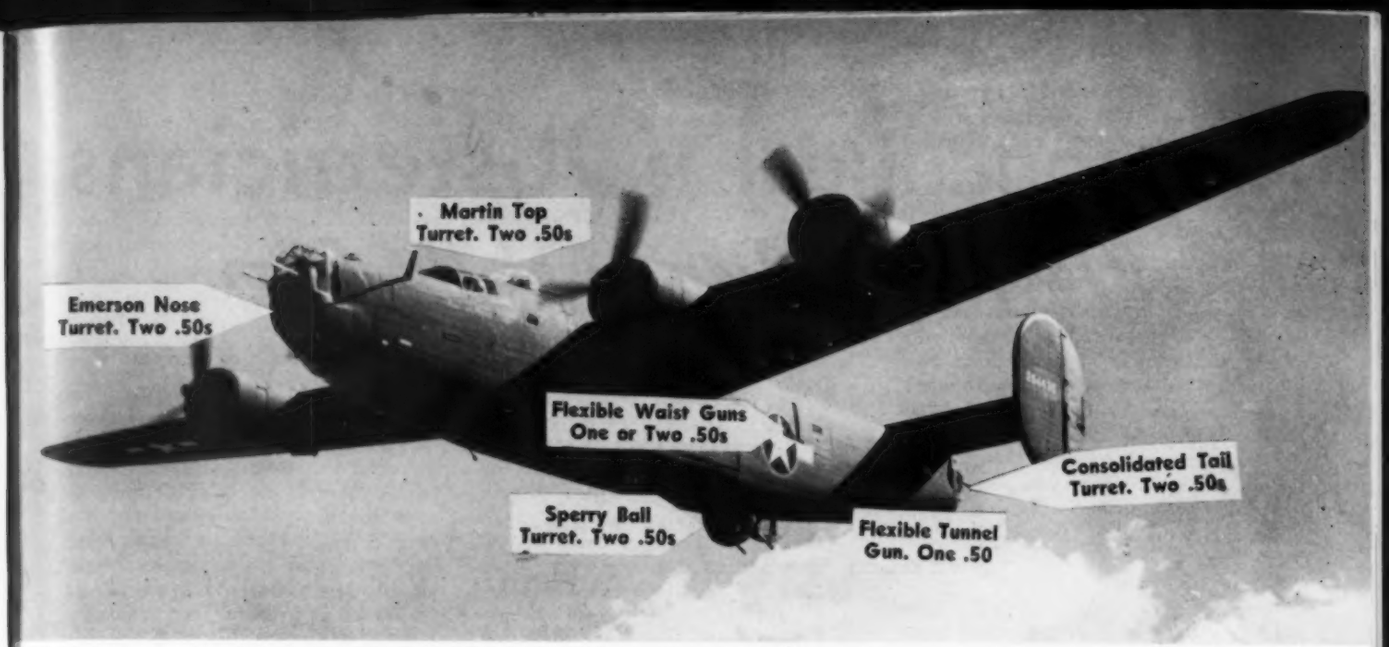

Martin Top Turret. Two .50s
Emerson Nose Turret. Two .50s
Flexible Waist Guns One or Two .50s
Consolidated Tail Turret. Two .50s
Sperry Ball Turret. Two .50s
Flexible Tunnel Gun. One .50

More Firepower For Liberators

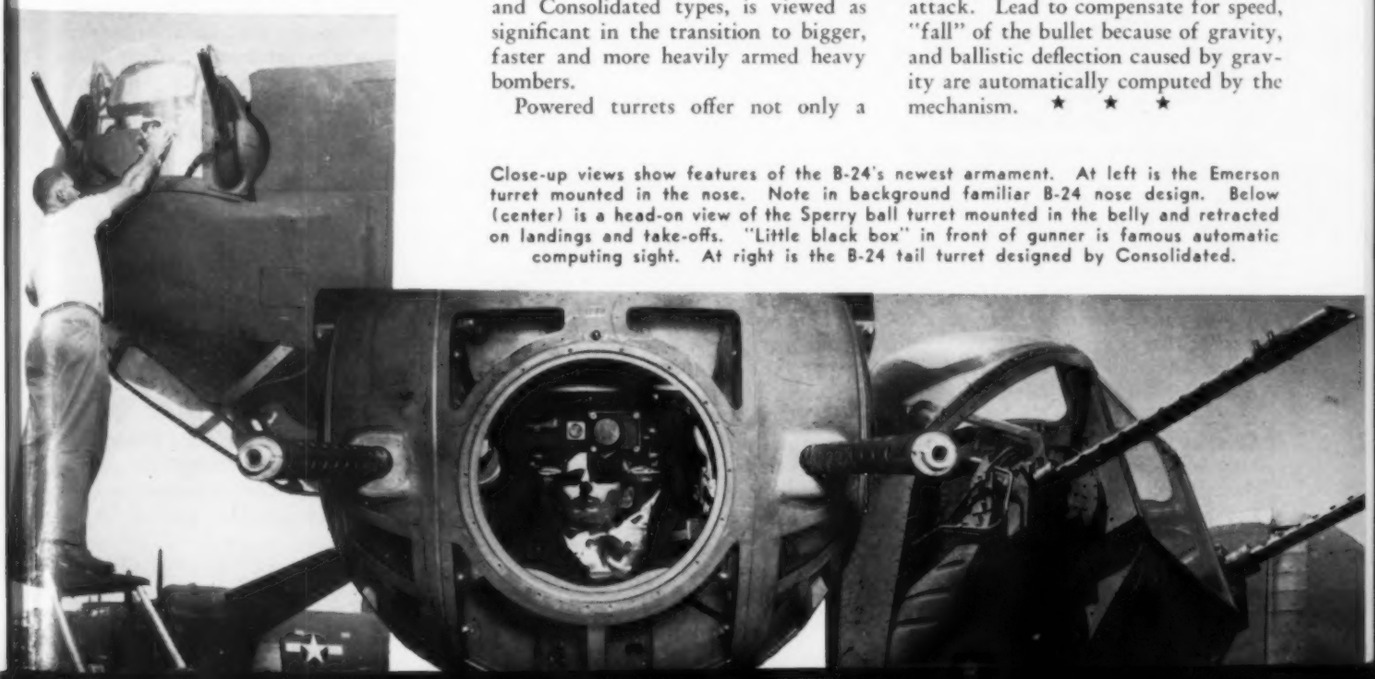
Consolidated-Vultee engineers at Fort Worth, Texas, have increased the Liberator's heavy fire power by installing an Emerson-powered gun turret in the B-24 nose and replacing its older-type belly guns with Sperry's formidable ball turret-with-automatic-computing-sight.

The modification, only slightly affecting the bomber's flight performance, brings to thirteen the total number of .50 calibre machine guns which defend it against enemy fighters. The tail carries a Consolidated-powered turret with twin guns, and the top position is armed with a twin-gunned Martin-powered turret. In addition, each waist is armed with either single or twin flexible .50's, and the tunnel beneath the waist has a single .50.

The nose formerly was armed with three flexible .50's. Installation of the Emerson turret necessitated redesigning of the nose compartment and new stressing to carry the added weight. The bombardier's station remains in the nose below the guns, but has been moved slightly rearward.

The new nose turret is viewed as heralding developments for Uncle Sam's new and still-secret super bombers now or soon to be in production. Some time ago a British announcement revealed Consolidated-Vultee was preparing a B-32, representing a great increase in all points over the B-24. Multiple powered gun turrets are expected to feature the new model. The B-24's employment of four powered turrets, using Sperry, Emerson, Martin and Consolidated types, is viewed as significant in the transition to bigger, faster and more heavily armed heavy bombers.

Powered turrets offer not only a wider and heavier arc of fire. They permit use of the ingenious Sperry automatic computing sight which has eliminated the element of guess from aerial gunnery. Called the "little black box", the Sperry sight points the guns automatically and continuously at the spot where the attacking plane will be by the time the bullets arrive on the target. Thus freed of mental calculations, the gunner has only to recognize the type of enemy plane as it approaches for attack and adjust his sight control to correspond to the dimensions of the attacker. When framed in a reflecting glass atop the sight, the attacking plane is in range and the gunner, by operating a foot treadle, follows the approach with precision as the enemy roars in for the attack. Lead to compensate for speed, "fall" of the bullet because of gravity, and ballistic deflection caused by gravity are automatically computed by the mechanism. ★ ★ ★



Close-up views show features of the B-24's newest armament. At left is the Emerson turret mounted in the nose. Note in background familiar B-24 nose design. Below (center) is a head-on view of the Sperry ball turret mounted in the belly and retracted on landings and take-offs. "Little black box" in front of gunner is famous automatic computing sight. At right is the B-24 tail turret designed by Consolidated.

Aeronautical Obstetricians

Forgotten Airmen of the War

By GEORGE R. CLAY

MILLIONS of words have been and will be written concerning the sagas of fighting men in all the multiple divisions of our all-out war. As yet little has been said in praise of the civilian instructors, better known as "aeronautical obstetricians", of the Army and Navy Air Forces.

Their jobs as aeronautical accoucheurs to the armed services must go on day in and day out to provide fledgling pilots for the ever-hungry maw of the greatest war machine the world has ever known.

The Army and Navy, traditional rivals, again are unable to agree on a nationwide standardized system of training. As a result, the War Training Service is forced to set up two entirely different training systems, one for the Army and one for the Navy.

How the Army and Navy Differ

The Army has decided that a ten-hour indoctrination course is all they need before their cadets are called into one of their primary schools. The instructor in these schools is required to give each student ten hours of dual instruction, during which time the essential training maneuvers are run through and the prospective cadets given some idea of what is expected of them in their future training. This program is designed to weed out the student who is inherently unable to fly because of air sickness or inaptitude. However, the instructor is placed in the position of never knowing just what his work has accomplished as he is never allowed to solo his trainee regardless of his proficiency.

At the beginning of this program, due to its magnitude, the shortage of CPT instructors was so great that the only qualifications necessary for an instructor was the ability to fly. A rating of any kind was unnecessary.

The Navy has ordered an entirely different sort of program. They first call their trainees into a primary preflight school where for two or three months they are given a rather rigorous course of ground school and physical training. After this they are sent to another college to which is attached a flying operation. The flight curriculum is made up of a minimum of thirty-five hours of flight with the hours of solo flight interspersed as is customary. The instructor is given from five to seven students and is required to bring these cadets up to the proficiency of the so-called private pilot standards of the CAA.

The program differs from Naval trainees inasmuch as the Navy calls for circular landing patterns and insists on their famous so-called one-two-three shots, which are simulated carrier deck forced landings and require a fine knowledge of the slip, which has been dropped from Army training. Finishing this course the cadet is then assigned to twenty hours of intermediate training, more often than not on the same field. This is designed merely to sharpen the trainee in the curricula already flown.

The student arriving on the flight line is usually a lad of about nineteen years. He is often wide-eyed and apprehensive. He was either an enthusiastic builder of model airplanes and flight crazy or has calmly made up his mind to fly rather than walk. In either case he has been an avid follower of the comic books now flooding the news stands. He is often a veritable repository of aeronautical lore which is not true. He is determined to fly; often feeling that the exertion of physical effort will overcome his shortcomings. The daily press has seen to it with apparent diabolical purpose that he is entering a dangerous game, yet with the audacity of youth he is ready to tackle it, suicidal it may be.

The hard-worked instructor must take this (his share of new program) with the patience of Job. He must teach this fledgling in thirty-five hours not only how to fly but the rudiments of why he is flying and what he is attempting to accomplish. He must have at the tip of his tongue the answer to almost every aeronautical question an eager student may think of. Those questions are often posers and worthy of the most careful answers. One student during one of the several official line inspections innocently asked a natural but difficult question like this: Why do the six bolts on the propeller hub of a Cub have the number 5 engraved on the head? (What's the answer?)

Military Status of Instructors

The instructor must be well informed on meteorology, on navigation, engines, aircraft and other studies required of the student. He must know all the answers in the book and woe unto the hapless instructor who answers wrong. He must know about aircraft identification, and be able to identify one streaking over the airport at 200 miles per hour. The student believes as all students have believed that their own instructor must know.

The adulation and respect given to his instructor is probably the reason many of us keep at the grind. It is probably the most sincere type of flattery known.

The civilian instructor is placed under quasi military rule although he is frozen to his job as inflexibly as any member of the armed forces. In order that this could be easily accomplished the Army and Navy recommended that both the flying and mechanical personnel be enlisted in either the Army or Navy Enlisted Reserve, an action which brings up many questions that so far go unanswered. If answered soon the discontent of youngsters, yet aching to see combat duty, tied to the prosaic job of instructing would be alleviated.

Will membership in the enlisted reserve entitle the member thereof to the emoluments the members of the active services receive? Is he for instance eligible for veterans hospitalization after the war? Is he eligible now for government insurance? Is he eligible for the preference rule in Civil Service ratings? Will he be eligible for membership in the American Legion? These questions are presumptuous but are worrying the civilian instructor tied to his job, as far as he now knows, for the duration. He is unable to better himself in any way unless his contractor sees fit to raise his salary, which in many cases is lower per hour than apprentices receive in shipyards or other defense organizations.

Why Instructors Grow Old

Instructors flying on Navy programs are now presented with a new hazard altogether unnecessary. Although he must have proved himself

flawless in flight maneuvers required by the CAA General Inspection branch, those maneuvers are useless in Navy instruction. I mean specifically those maneuvers which require constant practice to keep a pilot on the ball, namely pylon eights and low ground sequence. The Navy has replaced these maneuvers with their own conception of eights which is a combination of our old number two eights or cross road eights and pylon eights. General inspectors of the CAA are suddenly swooping down on Navy schools and asking the instructors to ride through the old sequence. Should an instructor slip, as two did recently, his license is lifted and the hapless instructor allowed to shift for himself in the matter of obtaining further instruction in order to regain his coveted license. In several instances disgruntled graduates of CAA schools have taken this method to get themselves released in order to join more attractive services.

The latest thing to make WTS organizations dissatisfied is the matter of uniform recommendations. The order for operators to have their personnel uniformed is as vague as the description of the uniform to be worn. In Iowa one tailoring representative made positive statements that all WTS uniforms must be purchased through his firm, throwing the operators into a frenzy and competing firms into a small war.

These uniforms are costing the instructors from sixty-five to ninety-five dollars and are cut on the lines of Army officers' uniform except for notched lapels on the blouse. The order concerning them specifically stated that uniforms would not be required on the line, or off duty. The time otherwise to wear them was not stated.

The instructor however, is not confronted by all work as his students are constantly creating new situations which keep everyone of the line amused. For instance while installing a landing light for the first time on the field the instructors warned their students to rock their wings when receiving the signal on the base or cross wind leg. Shortly afterwards an instructor warned his student to answer the light. The plane continued in the traffic pattern with the instructions apparently ignored. Again the instructor admonished the student and when the wings did not rock, he turned around angrily to see his student swaying crosswise in an effort to wiggle his wings. Another very bright student of mine who had seemed to catch on fast was taxiing up to a hangar, the apron of which was slanted outward. Without thinking myself and attempting to be jocular I turned around very seriously and asked him to throw the gear in low so we wouldn't roll back. The student nearly went into convulsions attempting to find the gear. He actually knew it was not there, yet his mind, otherwise very active, refused to work when an unaccustomed problem suddenly confronted it. This situation probably typifies instruction and its difficulties more than any I can express.

Some Observations

Every workman is entitled to see the results of his labors and possibly the flight instructor feels his position as keenly as an obstetrician or even a mother when he sends his students up for their first three solo hops. The instructor knows that largely the first hop around the field is little other than

BASICALLY SPEAKING . . .

By PVT. DANA A. BLOCKER

The toughest part of an instructor's job, says Lieut. Walter (Whit) Whitlock, member, Benevolent Brotherhood of Basic Instructors, Perrin Field, Texas, chapter, is thinking up new ways to pin back the ears of cadets suffering from severe attacks of overconfidence, cockiness. A lot of cadets think they are just about the hottest things ever to hit the flying line; they ought to have asbestos linings in the seats of their pants, to hear him tell it. But that's the way you'd expect them to be, Whit says. "It's our job to hold 'em down with one hand, and teach 'em to fly with the other."

A new class of Misters arrived at Perrin Field. Whit looked them over, clapped a hand over his bloodless face and staggered blindly into the locker room, where he dropped to a bench and dumbly began playing with a yo-yo.

The first cadet of this flight he was to take up led Whit by a stride as they walked to a trainer plane. "Lots of power in that baby, sir," the cadet offered. "Four hundred and fifty horses, isn't it, sir?"

"Yeah," Whit answered, recognizing the usual signs.

Once they were settled in the cockpit, Whit let him have it: "Look, Mister, even you can fly this thing; it's got pedals just like a cultivator."

Another time one of Whit's students had the controls at about 6,000 feet when the cadet, in a playful mood, apparently decided that an imaginary Focke-Wulf 190 was on his tail: Nothing to do but shake him off. Whit finally wrenched the controls free after a wild orgy of acrobatics that wound up in a spin. Whit brought the plane down and gingerly climbed out of the cockpit. Five minutes later the wised-up Mister slowly wrote these words on the flight room blackboard: "Hereinafter while in a spin I will not whistle three bars of 'Nearer My God To Thee'—then wait for my instructor to recover."

Later another of Whit's erring Misters solemnly wrote: "It is universally agreed by all concerned that I am probably the hottest prospect for a rubber sack (coffin) ever to hit the Perrin Field traffic pattern."

Whit's method of unrattling a badly rattled cadet by giving him a ridiculous and absurd command doesn't always snap the youngster out of it. This day the student was a little shaky, so Whit ordered: "Climb me up to 97,000 feet and do me a twenty-seven-turn spin to the left." Reading 6,000 feet on the altimeter, the Mister obediently changed the prop pitch and had climbed straight-away to 12,000 feet when through the interphone came a startled question: "Ninety-seven thousand feet, sir?"

a mechanical robot action, each movement of the student merely being exactly or as nearly as the student can emulate his instructor. However, each successive landing is more of the student's and less of the instructor's, which usually means that the first landing is the best the student will make for some time. However, the vagaries of solo take-offs and landings are many and in some instances hair raising. The greater majority are quite safe and unexciting.

If I were asked in what way the vast training program could be helped by having better qualified, better satisfied instructors, it would be for the CAA to allow the men to be transferred from operation to operation in order that a change of scenery and colleagues would be forever new, and the feeling that he was the forgotten man of the war would be alleviated. There are, of course, situations in which this could create more discontent, such as the case of married men with children in school. However, in the main for the men in their early twenties this would supply them with the interest that would relieve the deadly monotony.

In the case of keeping the instructors on their toes, the resident supervisor should be required to ride with his instructors at regular intervals and see that they are given an opportunity to practice those maneuvers the CAA seems to feel are necessary. I appreciate the order requiring the operator to allow the instructor 5 per cent of his flying time for practice. But then, do you know many operators?

I realize that the main point has been to turn out the trainees ever faster, and I realize that due to this great need the instructor has probably been imposed upon more than was meant. However, the average instructor is an intensely human individual, else he would have joined the ranks of paper doll cutters long ago.

I would also advocate that an instructor be absolutely confined to five students at a time and that his schedule be fixed so that like the instructor in Army primary he would have half a day to work. This business of flying from sun up to sun down, day after day and on Sundays if the weather has put him too far behind, is making old men out of too many fine youngsters who are growing old before their time.

BILL STOUT SAYS

(Continued from page 24)

a spread of about thirty-three feet. The cabin, varied in design to accommodate from two to five persons, will have a rounded plastic nose, so that pilot and passenger can see on all sides. The fuselage, of tear-drop shape, will be light steel and duraluminum construction, sheathed with a new plastic, which Stout says can't be described right now.

The engine of the helicab will be of conventional design, but lighter, of 125 horsepower. A vertical steering propeller of six feet diameter is set alongside the tail. Its function is to correct the torque caused by rotation of the big horizontal propeller. Including full load, two passengers, fuel and baggage, the helicab will weigh about 1,700 pounds. It will carry either airbag pontoons for landing in water, or fore and aft wheels for ground use. The helicab in flight can change direction rapidly and safely by tilting the thirty-three-foot overhead propeller to the desired angle.

Besides the three flying autos you'll be driving when peacetime aviation comes, Stout predicts that electronic controls will prevent collision and provide constant communication from plane to plane and from plane to ground, and establishment of air lane levels for various types of aircraft.

by
CHARLES A. ZWENG
Author of
"Radio & Instrument Flying," Etc.

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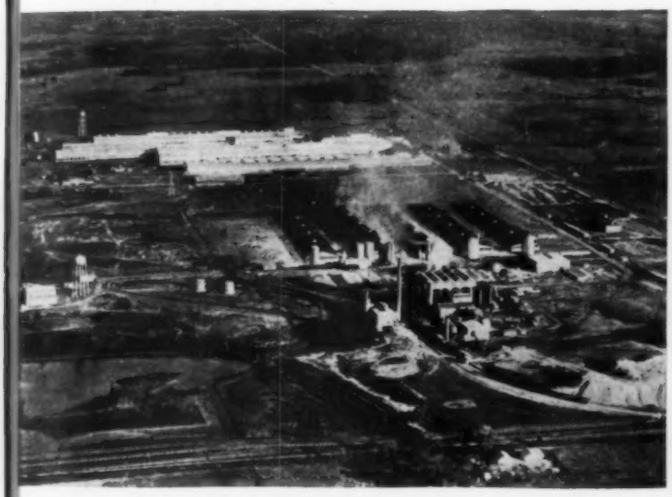
Reynolds Aluminum and finished airplane parts start in this Arkansas bauxite mine. Reynolds mines more bauxite per year than had ever been mined yearly before the war in the United States.



Aerial view of Reynolds plant at Listerhill, Alabama. Here bauxite is refined into alumina; the alumina is reduced into aluminum; and the aluminum is cast, alloyed and fabricated into sheet and rod.

Reynolds rolled aluminum alloy forging stock, tested and Army-Navy inspected, ready to be forged into aircraft propellers.

View of the Reynolds 300,000 sq. ft. expansion of the Parts Division in Louisville. New equipment includes giant 5,000 ton hydraulic press.

REPORT ON GLIDER TRANSPORT

Present . . .

(Continued from page 22)

sixty-five miles per hour or so. In tow at cruising rate, the speed generates noises to the tune of an express train's rumble. The weather was clear, and it looked like smooth sailing.

Walkie-talkie radio sets had been carried along to provide communications between crews. But by the time they passed Jackson, Mississippi, summer static had rendered the sets useless. A telephone hookup, using wires connecting the craft, would have been perfect. But telephone wires won't stretch, not enough to match the fifteen per cent elasticity of the eleven-sixteenths-inch nylon tow ropes.

Disaster Narrowly Averted

Unable to talk to its tow plane, the lead element's glider crew had their first alarm when black smoke suddenly streamed from the right engine of its C-47. A moment later, gasoline showered from the tug's tail. The extra fuel tanks in the rear fuselage had ceased delivering gasoline to the engine, and the crew chief had grabbed a bucket and was pouring it full for transfer to forward tanks when an air pocket splashed the 100-octane. Fumes filled the cabin as the bucket was dumped overboard. Now the only thing to do was to move the 600-pound fuel cell up front and syphon its contents into the forward cells. A rope hoist was improvised and for a syphon the crew utilized a relief tube from the pilot's cabin. For three hours they syphoned, while gathering thunderheads rolled and tossed the train. Lightning played outside the windows of the fume-filled cabin.

By now the gliders were having problems of their own. Upcurrents and downdrafts bounced them as much as fifty feet off level, pitching more violently than any sea had ever heaved a boat. To avoid overloads, the gliders had to dive and climb with each bounce to stay within a deviation of twenty per cent of the tug's line of flight—quite an accomplishment at the tail end of a 350-foot rope while flying. At times, near Atlanta, visibility got so bad contact was almost lost between gliders and tow planes. Cargo tugged at its moorings and wings bristled under terrific stresses, but the two aerial trains see-sawed through the storms until their destination was reached.

"It felt mighty good to come down at Laurinburg-Maxton," commented Captain Edmond Brown of Dallas, Texas, who has charge of the glider unit of the A-3 section in the AAF Training Command's headquarters.

"But don't get the idea it was too dangerous. We had everything under control except that 100-octane dynamite, and next trip we'll be fixed for that, too. Those storms had us working overtime for a while, but emergency landings would have been duck soup for those gliders. They can sit down on a postage stamp. Recently twenty-five went into a Carolina field too small and too soft for their tow planes. But their tugs swooped low, picked up their tow ropes without landing, and flew them out of there without a hitch.

"People used to think gliders were expendable. But they aren't. We're perfecting them in many ways. Right now our big gliders are at about the same stage of the auto back in the Model T days. But we're accomplishing in months what took years to get around to in the car business."

Future . . .

(Continued from page 23)

ground of dead-reckoning navigation, communication and other allied subjects. In free flight, a cargo glider handles like a large airplane with a dead motor except that it has a low stalling speed and will go forward 15,000 feet with every 1,000 feet loss of altitude. The gliders of tomorrow will have flaps, spoilers and retractable landing gear. In addition to being a competent pilot of single or multi-motored aircraft, the postwar glider pilot will be required to perfect accurate judgment in flying and landing gliders at airports in heavy air traffic.

The Army and Navy have developed and invented many devices related to the use of gliders as passenger and cargo transports. Most of these developments are and will remain military secrets until after the war. But after the last shot the ghost of Jules Verne will fly again.

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TRUE STORIES ABOUT *Vega*

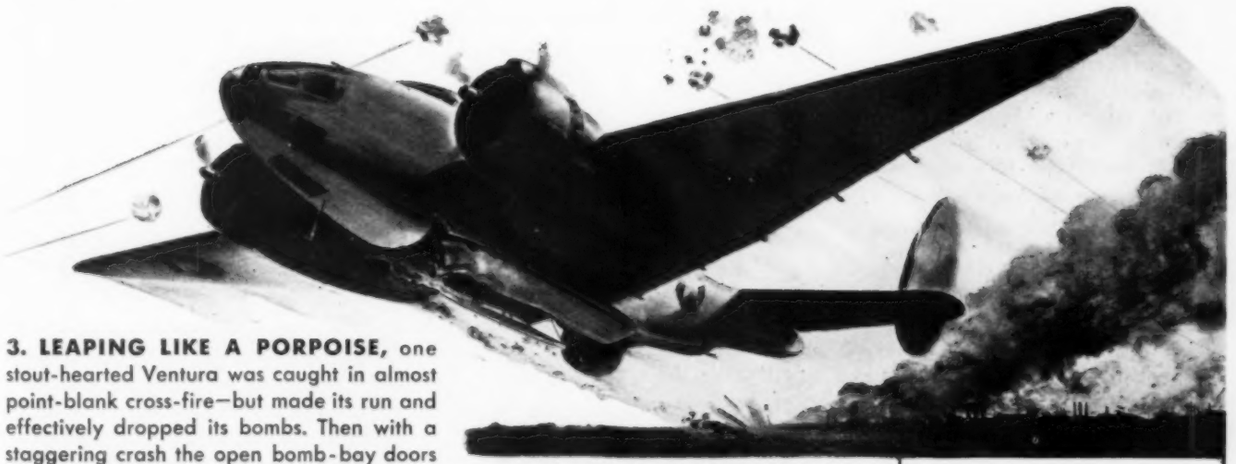
HOLLAND EARTH FOR A HOMESICK DUTCHMAN

How a Vega Ventura Bomber Brought Home Dirt from the Land it Raided!

A handful of Holland earth, scraped from the bomb-bay doors of a returned Ventura medium bomber—back victorious from a smashing raid on Axis-held Europe—tells an exciting, true story of the dependability of one fighting American warplane.

1. VEGA VENTURA medium bombers were chosen for a smashing role in the big daylight raid on the Philips Wireless Works in Eindhoven, Holland. Last to go over the target, their job was to drop incendiaries from roof-top heights on factory buildings already damaged by high-explosive bombs dropped by other aircraft earlier in the raid.

2. AT TREE TOP LEVEL they swept in—lower even than the "flak towers" built to protect this vital Nazi supply center. The defensive gunfire was heavy, and many a crewman saw the interior of his Ventura clearly lighted by licking tongues of flame from burning buildings or by exploding shells.



3. LEAPING LIKE A PORPOISE, one stout-hearted Ventura was caught in almost point-blank cross-fire—but made its run and effectively dropped its bombs. Then with a staggering crash the open bomb-bay doors scraped the ground!

4. A BREATHTAKING MOMENT—Then with a surge of its two powerful engines, the Ventura fought its way up into the air again, away from danger, and across the channel to its home base in England.

5. CAKED IN THE CHINKS of its battered bomb-bay doors was a present for a homesick Hollander. It was Dutch soil—scooped from the Netherlands and brought back by the Vega Ventura—an American bomber tough enough to take a direct hit, bounce off the ground, and still fly its crew home safely.

This is another in a series of stories about Lockheed and Vega and their accomplishments. Watch the pages of this magazine for another true aviation adventure.

Vega

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Do you suffer from computer confusion?

STOP! Wait! Our unscientific method will save you.

Satisfaction guaranteed to everyone. Just read below.

Computer Confusion

How to End it With the Unscientific Method

By LT. LARRY J. FISHER, CAPC?

Photos by J. B. Clark

I'M not very scientific and mathematics brings on a nightmarish cold sweat. With apprehension, I opened a computer instruction book and my worst fears were confirmed—for there was the scientific approach, beautifully illustrated, and I was sunk!

Perhaps you, too, suffer from Computer Confusion and the neat black and white lines become a blur before your eyes. If so (and if you'll promise to keep it a military secret from the experts who write instruction books) I'll confide in you my new Unscientific Method for the use of the E6-B type computer. The experts will throw up their hands in horror and who will blame them? But this Unscientific Method has worked nicely for me as navigator on several hundred hours of anti-submarine patrol over the Gulf of Mexico, out of sight of land.

You'll be proud of your E6-B. If you're not in the armed services your E6-B will, of course, be a commercial version*. But the only difference is in the material of which it is made. I haven't tried the computer's ability at cooking but I do know that the E6-B will take you gently by the hand and lead you back to your home base from almost any kind of navigational mixup.

It dashes off an off-course problem with one scratch of the pencil and one flip of the slide; it will do a radius of action with one setting of the slide rule face; in short, it's a honey.

The first step in our Unscientific Method is to get *you* gentled down to where you won't buck and rear at the sight of it. I'll admit, at first glance, that it looks more complicated than the instrument panel of a B-24 but after a short acquaintance with it, the E6-B's face will be as plain and homely as the face of that gal who used to live next door—except that it will offer you more entertainment and satisfaction than she ever did.

Now this would be the appropriate place to talk about plotting discs, polar co-ordinate charts, diverging lines, grommets and the like. But, frankly, I don't know whatinhell they mean, so I'll have to skip it.

Instead, let's pick up the E6-B and take a good look at it. (Fig. 1) First, the window side. All right — there's the window and in the center is a small circular dot which you and I will know hereafter by the technical name of — hold your breath — the CENTER DOT. Around the window is a compass rose, with the customary 360 degrees. We'll call the whole assembly

Fig. 1

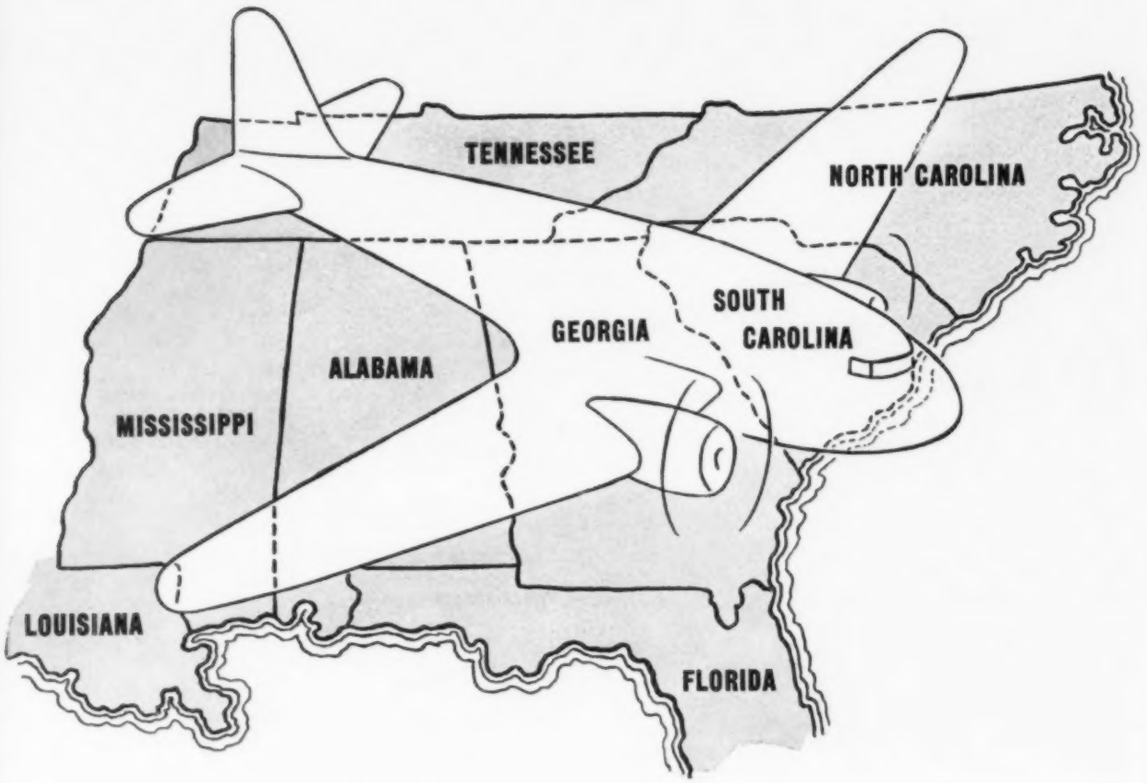
of compass rose and window a WINDOW, just to make it complicated. By now you have discovered that the window can be rotated.

Above the window is a TRUE INDEX ARROW. A scale, calibrated out to

(Continued on page 42)

*Distributed by Pan American Navigation Service, Weems System of Navigation and others.

THINGS TO COME



To serve the progress of our nation in peace as in war, Georgia Air Service, Inc., with its subsidiary, Southeastern Air Express, Inc., hopes to pioneer the development of feeder lines throughout the Southeast. This service is planned in addition to the present expanding fixed base operations. The men . . . the experience . . . the equipment . . . are here in our war time organization . . . ready for conversion to the peace time needs of a growing South.

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COMPUTER CONFUSION

(Continued from page 40)

forty-five degrees on each side of this arrow, and labelled "drift, left and right" and "variation East and West," will be left severely alone for the time being.

Later, we will use this scale to eliminate the biggest confuser in navigation —drift and drift correction. In fact, in our Unscientific Method, we'll eliminate drift altogether and who could ask for more?

Now that we've looked at the window, let's look through it and discover the SLIDE. Could be that it's a polar co-ordinate chart, but it slides so we'll just call it a SLIDE. This, you have discovered has two sides.

The side with the *square grid* on its lower half has the figures "400" at the top. So let's name it either SQUARE GRID side or make it one of the 400. The other side is topped by the figures No. "300" so we'll call it that.

But first a word about the proper care and feeding of your E6-B. Buy yourself a very soft pencil, about grade 6-B (notice how that matches up!) and use it exclusively. Buy one without an eraser for, they tell me, an eraser is bad medicine for the surface of the window. Make all erasures with your finger or the heel of your hand. With a soft pencil, heavy markings are not necessary. Clean the window occasionally with a soft rag; never wet the window.

To preserve the correct alignment of the instrument, always hold it in the the manner illustrated in Fig. 1. Rotate the window (as the unattached right hand is doing in the picture) by grasping the compass ring on the outside. Never attempt to turn it by pressing on the window itself.

Outside of keeping the computer in its case when not in use and keeping it out of the sun, the above is, I'm afraid, practically all you need to be cautioned about in the maintenance of Mr. Dalton's latest gem.

I hope by now that the window side has lost its terrors for you. Here's an off-course example to show your friends. With the agility of a magician pulling a rabbit out of the hat, you can quickly convince any bystanders that the computer is well worth the dough you paid for it. You'll find that the trick can be done in much less time than it takes to tell you how, so follow through carefully:

Example One. (Fig. 2) "Off-Course Correction"

Finding yourself twenty miles to the right of your intended course, on a heading of North, the E6-B will tell you (a) what to fly to parallel your present course and (b) what heading to fly to get to your destination. Here's how:

1. *Remove the slide and reinsert it so that the square grid side (400 on top) is up.*

2. *Your heading is North. Rotate window until North is below the True Index Arrow.*

3. *Slide the slide until the center dot is on the top line of the square grid.*

On the square grid, each large square represents ten miles; the small squares are two miles. Consequently a line drawn to the right for one large square (or five small ones) would represent a distance of ten miles to the right of the course; if off course to the left, the line would be drawn in that direction, always from the center dot. Meanwhile, you're twenty miles to the right of your course, as you found when you buzzed the water tower.

4. *On the square grid mark a line (ah! ah! use a soft pencil) from the center dot to the right for twenty; that is , mark off two large squares to the right, representing your twenty miles off course to the right. At the end of the line, draw a short vertical line, thus forming a long-legged letter "T."*

We might as well leave you hanging like a helicopter over that water tower for a minute and mention that the line you just drew was really unnecessary in this and subsequent problems. It merely helps you, just now, to visualize the situation. Later a small cross mark or a dot (at where the end of the line would be) will be sufficient. Incidentally, if you use a dot, a small circle drawn around it will help you to find it later.

In your present embarrassing situation (off course) you know that you have flown a distance of 110 miles from your base. Now:

5. *Slip the slide out of the computer and turn it over to the 300 side. (Fig. 3) Set 110 (miles) on the center dot and you will note that your pencil mark ends on a slanting line (numbered "10") to the right. (I hope that you've kept North under the True Index Arrow all this time.) This represents ten degrees drift. Without moving anything, mentally subtract this ten degrees from your heading (360) and you'll find that a heading of 350 degrees will parallel your intended track (but it won't get you to your destination).*

Now the final step. Let's assume your remaining distance to go is 200 miles. (Total distance, base to destination, was 310 miles.)

6. *Slide 200 (miles) to the center dot and again on the right at the end of the pencil line read the slanting line. It's six degrees now. This represents six additional degrees of right drift. Add this six to the ten degrees above and your little friend in need has told you that sixteen degrees right drift subtracted from your heading (360) will give you a new heading of 344 degrees.*

Kick left rudder to this heading and you'll be put-putting straight to that blonde deal who's waiting at your destination (you hope).

Not bad, huh? At the risk of sounding professorish, I'd like to suggest that you understand each example thoroughly and work it several times before swinging on to the next. Otherwise you may emerge in a flat spin and the purpose of our Unscientific Method will be defeated.

Example Two. Wind Problem

In plotting cross-country courses (and flying them) wind and wind drift will probably be the most common problem for your E6-B to solve. It's easy as a spin in a Link Trainer. Here we go:

1. *Set the wind direction (260 degrees in this example) on the Index Arrow. Set center dot on any numbered line.*

Let's set 180 on center dot. Each line up is two units. For tweny units,

(Continued on page 44)

Fig. 2

Fig. 3

ARGUS—With a Hundred Eyes That Never Sleep

British fighting men know it as the *Argus*—named for a character out of Greek mythology who had "a hundred eyes that never sleep."

To Americans it is the *Forwarder*—the dependable, sturdy little utility-cargo plane.

Officially designated by the U. S. Army as the UC-61A, this little-sung member of the Fairchild airplane family is doing a heroic around-the-clock job on many a fighting front of the United Nations.

Getting precious medical supplies through to where they are needed in a hurry.

Carrying the ammunition to where it is needed most.

Setting down and taking off in tiny patches of clearing, so small that larger planes could not use them.

Shuttling Army personnel between staff headquarters and "where the shooting is."

Acting as the eyes of the Army in remote or inaccessible observation posts.

These and a hundred and one other routine duties well performed have long since earned for the trim little UC-61A the undying affection of men who have depended upon it to get them in and out of tight places.

Those who envision the universal use of airplanes after the war—both commercially and privately—may see in the four-place UC-61A the forerunner of tomorrow's taxi of the air. Another example of Fairchild's "touch of tomorrow in the planes of today."

BUY U. S. WAR BONDS AND STAMPS

Fairchild Aircraft

Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland.....Burlington, North Carolina

COMPUTER CONFUSION

(Continued from page 42)

you'd count up ten lines and end on 200.

2. Draw the wind velocity (in this case twenty mph) from the center dot

Fig. 4

towards the index arrow; that is, INTO THE WIND. (Fig. 4). With the center dot on 180 the end of your line will be at 200. Make a short horizontal line across the end (at 200). Later you may use a dot or cross at this point.

This is all that needs to be done about the wind. The main point to remember with this computer is to ALWAYS LAY OFF THE WIND FIRST AND DRAW INTO THE WIND.

By the way, all problems worked out in our Unscientific Method are based on true. No use cluttering up the works with variation and deviation. Apply them in your head or with a pencil. If you're hazy about going from true to compass, drop me a line, c/o SOUTHERN FLIGHT, and I'll give you an Unscientific Method for that.

We now arrive at the second and final step of the problem and are you going to be surprised at the dope the light-runnin' E6-B is going to give you:

3. Rotate the window until your true course (110 degrees in this example) is on the Index Arrow.

4. With the 300 side up, slide the slider to where the end of the wind line (which you drew) intersects the 120 mph AIR SPEED CURVE. This is the horizontal curved line directly under the figures 120 (Fig. 5).

Now you have all the answers. Look at the center dot and find your ground speed, 137 mph. Look at the right (at the intersection of wind line and airspeed curve) and read five degrees right drift correction. All drift indications given in this type of problem are DRIFT CORRECTIONS. If the pencil mark is to the right of the center vertical line, add. To the left, subtract.

What's that? Sure, I *did* promise to eliminate drift and drift correction entirely and here's how. It's breath taking!

Look at the scale alongside the True Index Arrow. Look to the right and see 10, 20, 30, 40, 45. Likewise to the left. Here's the answer in our Unscientific Method:

If your wind line pencil mark is on the *right* of the vertical line, do this: find, on the right hand scale (top scale alongside the index arrow) the same number of degrees as indicated by the pencil mark. Then read below on the compass rose, the TRUE HEADING. That, my friend, is what to fly (after correcting for variation and deviation) and you don't have to care whether it is drift or drift correction or what-not.

In the example we're working we found five degrees at the end of our pencil mark. You don't even have to know five degrees of what. Just look to the top and ON THE SAME SIDE AS THE PENCIL MARK (right, in this case) count over five notches to the right, read below and find 115 degrees, which is the true HEADING for a true course of 110 degrees. (The 110 which you set on the Index Arrow awhile back, in step No. 3, should still be there idling around.)

Of course, you could add mentally five degrees right drift correction and get the same answer. But I'm lazy and I let the E6-B earn its keep by doing it for me. The main point is that it eliminates any confusion as to whether to add or to substract.

Incidentally, it may be helpful to remember along about here that HEADING means *"corrected for wind."*

Just to make sure I haven't confused you too much, let's run through another example once lightly. Remember, always plot the wind first.

Example Three. Another Wind Problem

The wind is East at thirty mph. True course is 150 degrees. Air speed, 120.

Fig. 5

1. Set East to true index.

2. Draw thirty miles UP from center dot.

3. Rotate window to true course, 150 degrees.

4. Slide 120 mph. air speed to end of wind line pencil mark.

5 Read ground speed on center dot, 102 mph.

6. Read drift correction, thirteen degrees, left, on airspeed curve.

7. On left of True Index Arrow, locate thirteen.

8. Below it, on compass rose, read 137 degrees true HEADING.

Catch on? Remember, satisfaction guaranteed within ten days or your money back. Don't fret too much if your working out of these problems doesn't come out to the exact degree of the examples. There may be a slight difference in computer construction combined with placement of pencil marks to throw you off a degree or two. Anyhow, you're an unusual pilot if you can hold to an exact course with all the combined factors you have working against you.

Here's another neat trick. If the true course, true heading and drift correction are known, the wind direction and velocity are easily found. Promise not to tell? Well, its just Example Two worked backwards:

Flying on a true heading of 115, you are making good a true course of 110 degrees. Obviously you are applying five degrees right drift correction. Your air speed is 120 mph. and ground speed is 137. Find wind direction and velocity.

Example Four: To Find Wind Direction and Velocity
(where A/S, G/S and drift are known)

1. Set true course 110 degrees on Index Arrow.

2. Set ground speed 137 mph. on center dot.

3. Look along the 120 air speed curve to the right (because drift correction is right); find where it intersects the five degree slanting line and mark a cross at the intersection. (This is the five degree drift correction mentioned above.)

4. Rotate window until the cross is on the center vertical line, with cross ABOVE the center dot.

5. Read wind direction on true index arrow, 258 degrees.

6. Read wind velocity by counting upward from center dot to pencil cross, twenty mph.

(Continued on page 46)

"BACK THE ATTACK — WITH WAR BONDS"

Battleship of the Skies

You're looking through the waist gunner's window of a Boeing Flying Fortress*. . . at another Fortress on its test run near Seattle. Peaceful enough here, it nonetheless represents 32 tons of the most deadly fighting mechanism ever devised.

The Boeing Fortress now has a maximum bomb capacity of more than 10 *tons* . . . equaling or exceeding that of any other bomber, Allied or Axis, now in service.

Its stability and general flight characteristics make it a superior "platform" for high-level bombing of the most destructive accuracy.

The Flying Fortress has great defensive firepower and is credited with a remarkably high average of successfully completed combat missions.

All this, of course, is not just happenstance. It stems from the determination of the Boeing company nine years ago to build an airplane unlike any then in existence, an airplane that would be truly a "Battleship of the Skies."

To carry through such a project meant years of costly research. It meant continuing advancement from one stage to another, including long experimentation at stratosphere altitudes where few men had ever been. It meant utilizing the skills of many hundreds of engineers representing more than 25 different engineering fields.

It meant financial courage of a high order, for the original Flying Fortress was a wholly private venture financed throughout by Boeing.

Today Boeing's foresight and faith are more than justified by the outstanding record of Flying Fortresses in the war.

Tomorrow you may look to Boeing for peacetime products of equal leadership. The phrase "Built by Boeing" means they're bound to be good.

DESIGNERS OF THE FLYING FORTRESS • THE STRATOLINER • PAN AMERICAN CLIPPERS **BOEING**

*THE TERMS "FLYING FORTRESS" AND "STRATOLINER" ARE REGISTERED BOEING TRADE-MARKS

COMPUTER CONFUSION

(Continued from page 44)

That's all there is to it. You will, of course, in actual practice, work from compass heading through magnetic heading to true heading. The difference between true heading and true course is your degree of drift correction. After finding that, you turn confidently to your little pal computer and go on from there in the steps outlined above.

Despite the fact that the E6-B is two-faced, I think you'll forgive it when you turn over and find what the other face can do. Its little backside is known by various names including TIMESPEEDDISTANCESCALE but, inasmuch as it's really nothing but a circular slide rule, let us now, students, continue to pursue our Unscientific Method and call it the Slide Rule Face. In case any confusion arises in your mind, it ain't the face with the window.

Here I go giving away more military secrets. Remember the following simple fact and you'll never suffer from that insidious disease "slide rule face confusion." Here are the magic words: Miles Are Always on the Outside Scale. Just run around repeating that sentence for a day or two and you'll have automatically vaccinated yourself against this dread disease, regardless of altitude.

Our arrow on this side, with its Lana Turner curves, is the Hour Index. It represents one hour or sixty minutes. You can't miss it. It's the only arrow there and it's big enough.

Suppose we found our ground speed was ninety mph. Set the Hour Index Arrow on ninety and we'll go to town.

How long will it take to fly fifteen miles? Remember, Miles on the Outside and look up fifteen (miles). Directly below fifteen, you'll find ten minutes on the inner scale and that's the answer. Just for practice now, at the same setting, check a few with me: How long for eighteen miles? (Answer: twelve minutes); sixty miles? (forty minutes); forty-seven miles? (thirty-one and three-tenths minutes).

You've caught on by now that Miles are on the *outside* scale, Minutes are on the first *inner* scale; by deduction and examination you'll discover that Hours are on the *second inner* scale.

With the same ground speed (Hour Index Arrow still on ninety) how far can we fly in thirty minutes? (forty-five miles); in eight minutes? (twelve miles); in eighteen minutes? (twenty-seven miles). You're doin' fine!

Now to the second inner scale (hours). How far in one hour and twenty minutes? Locate 1:20 on second inner scale; look above to outside miles scale and read twelve. Obviously, at ninety mph. you'd do better than twelve miles in that time; answer, add a zero and find 120 miles as the answer.

This is the hot stuff—never a furrow in your brow over multiplication and division.

Now let's get out of the traffic pattern and try another approach. You've flown forty miles in thirty minutes. What's the ground speed? Locate forty miles on the Outside scale. Rotate the disc until thirty minutes is directly under the forty. Then, on the Hour Index Arrow read eighty, which is eighty mph. ground speed and there you are.

Try one more: You've covered twenty-two miles (Outside Scale for Miles) in twelve minutes. Answer 110 mph. ground speed. (Add a zero to the eleven).

Planning a Mexican trip by automobile some summer? Or will you take a yacht cruise? You'll want to take the E6-B along.

On the outside scale (around seventy) notice "Naut" connected with a line to "Stat." Also find "KM" just past twelve on the outside scale. You're all set for either type of trip.

Rotate the disc and set twenty under the nautical arrow point. Under the "Stat" arrow (to the right) read twenty-three. Answer: twenty nautical miles are equal to twenty-three statute miles, approximately. Without moving disc, look under "KM" and find thirty-seven. This means that twenty-three statute miles equal thirty-seven kilometers. A handy gadget, I calls it.

One more example: thirty nautical miles equal thirty-four and one-half statute miles and fifty-five and one-half kilometers.

By a thorough indoctrination and familiarization of procedure with the TimeSpeedDistanceNautical to Statute Converter the student can quickly become adept at solving computations of this type. (Gosh! where did that come from?)

Anyhow, play around with the slide rule face and you'll be amply rewarded. We'll come back to the temperature conversion stuff in a later session.

To avoid giving you mental indigestion, we'll now turn back to the window side for one of the E6-B's most magnificent and super-colossal achievements: namely, Wind from Ground Speed Measurements.

Example Five: Wind from Ground Speeds

On a true heading of 351 degrees, the ground speed was 134 miles and we found on a true heading of 275 degrees, the ground speed was ninety-eight miles. Air speed was 120. What was direction and force of the wind?

1. Set air speed, 120 mph., under center dot.

2. Rotate window to set first heading 351 degrees to True Index Arrow.

3. Trace along the 134 horizontal curved line from one side to the other (left to right). (Fig. 6.)

Fig. 6

4. Rotate window to set the second heading, 275 degrees on the True Index Arrow.

5. Trace along the ninety-eight horizontal curved line at the point it intersects the first line you drew. (Fig. 7.)

Fig. 7

You have now drawn in your two ground speeds on two headings and we come to the final step.

6. Rotate window until these intersecting pencil lines are on the vertical center line BELOW the center dot. (Fig. 8.)

Fig. 8

(Continued on page 48)

Producing for Victory

Air Transport Command pilots ready to fly away trainers built by Globe for the Army Air Forces.

GLOBE AIRCRAFT CORPORATION

FORT WORTH, TEXAS

Manufacturers of the AT-10 Advanced Trainer and the Swift GC-1

Fig. 9

COMPUTER CONFUSION

(Continued from page 46)

7. Read wind direction at Index Arrow, 238 degrees.

8. Count down from center dot to pencil marks and find velocity of thirty mph.

Any pilot who has a fairly accurate check on his ground speeds can use the above solution very easily to find wind direction and velocity.

Just as neat is the solution by the double drift method. This, however, requires an accurate drift meter, constant air speed and a navigator, among other things. However, it's fun to work it out; the Air Force navigation schools enjoy demonstrating it to E6-B students and our Unscientific Method wants to keep you up to date. So here goes with an Air Force example:

Example Six: Wind from Drift Measurements

The procedure for the double drift is to note carefully the heading and drift on the course flown. Then a two-minute detour is made to the right at a forty-five-degree angle. Two minutes later another forty-five-degree course is flown to the left. Then back on regular course.

On course, the heading was sixty degrees true. Turning on the forty-five-degree right leg, the drift was found to be fifteen degrees left. Then turning on a forty-five-degree left leg, drift was five degrees right. The air speed was 120 mph. Find wind direction and force.

1. Set air speed, 120, on center dot.

2. Set 105 on True Index Arrow. This represents the heading on the right leg: a heading of sixty plus forty-five-degree turn equals 105 degrees. Or, you may set the heading, sixty, below forty-five on the top scale, left of the true index arrow.

3. Find the slanting line representing fifteen degrees left drift. It's on the left side of the vertical center line. Trace it. (Fig. 9.)

You have now represented, in glowing technicolor, the drift on the right leg. We'll follow the same procedure as you make the forty-five-degree left leg. Actually you're making a ninety-degree turn in relation to the 105-degree right leg just flown, so subtract ninety and find fifteen degrees, your present heading.

4. Set fifteen degrees under the Index Arrow. This is the heading on the left leg. Or you may set sixty degrees below forty-five on the top scale, right of the true index arrow.

5. On this left leg, the drift was five degrees right. Find the slanting line representing five degrees and trace it where it intersects the other pencil mark. (Fig. 10.)

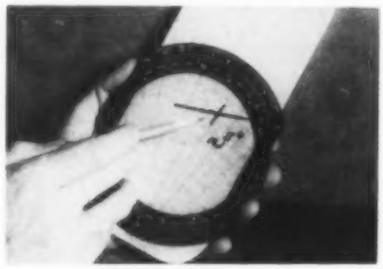


Fig. 10

6. Just as you did in Example Five, rotate the marks to where they are exactly below the center dot.

7. Read wind direction, 216 degrees, from the Index Arrow.

8. Count down from center dot to pencil marks and find velocity of thirty-eight mph. (Fig. 11.)

Fig. 11

As a final and positive check, rotate window to your on-course heading, sixty degrees on True Index Arrow. Read 156 mph. ground speed where the pencil marks cross and read six degrees left drift. If this corresponds to your actual ground speed and drift meter reading you're right on the money.

If you should have any difficulty with these or similar problems, send me a "May day" c/o SOUTHERN FLIGHT. But I believe a careful recheck of each step, by steps, will clear things up.

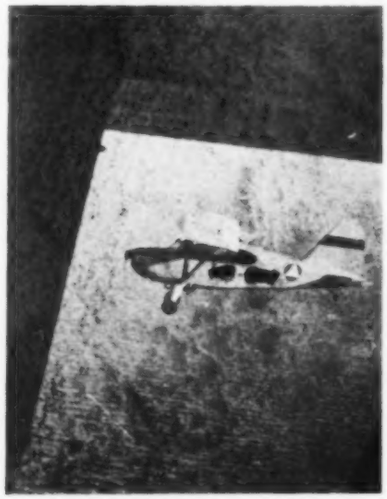
Most troubles arise from misreading the slider. On the 300 side, all horizontal lines are twos; vertical lines are ones, except that below speeds of 100 mph., they become twos. Don't let this throw you. A little practice will clear it up.

There are still other tricks with this beautiful little instrument but, with the paper shortage being what it is, they'll have to come at a later date. Particularly interesting is the interception problem. The E6-B gives you all the answers with three pencil marks and a flip of the slide rule. Also interesting is the radius of action (done with one setting of the slide rule face) and the airspeed-temperature conversions.

If my Unscientific Method has helped, perhaps I can drag out some equally screwy explanations for your other navigation problems. Personally, I'll go to any lengths to avoid mathematics as this article probably shows—all too plainly.

Anyhow, good E6-Being to you.

NOTE: The author wishes to express his thanks to Lieut. E. O. Thedinga, AAFAFS Department of Ground Training, Ellington Field, Texas; Lieut. Elbert C. Isom, CAP Coastal Patrol; Charles A. Zweng, Pan American Navigation Service, North Hollywood, Calif., and to TM 1-205 for material and assistance in the preparation of "Computer Confusion."



IN SMALL PLANES like this Stinson, the Civil Air Patrol has developed expert navigators. Carrying bombs or depth charges, they have flown single-engined planes over 16,000,000 miles on anti-submarine patrol, flying out of sight of land as far as thirty to fifty miles to sea. Faulty navigation out there would prove fatal because of the limited amount of fuel carried. It was with such background that Lt. Fisher, an anti-submarine patrol veteran of the CAP, prepared the foregoing article, "Computer Confusion."

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7

MERCHANDISING BY AIR

(Continued from page 30)

no modern surface transport facilities exist.

In addition, every manufacturer and shipper knows that one of the important elements of cost in transportation is the packing required to make the product ready for shipment. In this field, also, air cargo makes a great contribution. In the generally smooth ocean of the air, shipments are usually not tossed about as they are on the high seas, or in a railroad car or truck. Packing requirements need not be so stringent. The Army and the Navy, in their transport operations during the war, have contributed much to the development of new shipping practices for air. The Naval Air Transport Service has taken shipments arriving at its bases by surface means and repacked them for transportation by air. The repacking has resulted in substantial reductions in the weight of the packed articles. They have reported an average saving of 15 per cent in shipping weights as a result of this repacking practice. Even with these great savings there remains much to be done in the development of packing techniques for the peculiar and light weight requirements of air transportation. Contributing to decreased cost on the part of the manufacturer, it is also an element which must be taken into consideration when we think of surface transportation rates being so much a pound. Actually, these transportation rates include a charge for a large amount of packing which will not be necessary in air cargo.

Less Warehousing Needed

Of great and not yet wholly measured value of the speed of the airplane in merchandising is its ability to make it possible to service products sold by a manufacturer to a consumer located a great distance away with the same ease with which he might be able to serve the consumer who is close at hand through the facilities of surface transport. This holds potentialties both at home and abroad. Our economy has centered around the existence of fairly concentrated sources of supply with numerous wholesale and distribution centers scattered throughout the nation and the world, designed to supply in a steady stream and to service with quick facility the commodities handled. With the speed of air transportation the need for the wholesaler, the distribution center, and the necessity for the retailer to maintain a large inventory is diminished.

In the international field, for example, if we sell automobiles or refrigerators or some other complex article of manufacture, requiring for their successful promotion, operation, maintenance, and adaption to local use spare parts and expert service employes, it will no longer be necessary for them to be maintained at numerous branch offices. The airplane can transport many of the needed parts, supplies, and service to distant points —even to Europe, South America, and the Orient—with the same and greater facility than those supplies and services can be transported now by train between New York and the Coast.

The effect of the speed of air transportation on many of the retailers at home will be substantial. Some of them will no longer find it necessary to place an order for merchandise weeks or months in advance and blind to the actual need which they might be experiencing at the time for which they have been ordering. The retailer will not have to incur the risk of receiving the goods ordered weeks or months previously which by the time he receives them have lost their current appeal. Faced with the demands of a current and pressing market, he will be able to order his goods and receive them by air in time to supply the need when it is most acute. His merchandise will not arrive late, in time only to grasp desperately after the vanishing coat-tails of a fading market but will arrive in the high season of impatient demand. He will be able to establish more nearly a balance between the forces of supply and demand.

Thus have we briefly mentioned some of the aspects of merchandising by air. We cannot foresee with clarity all the ramifications which the speed of air transportation in carrying men and the products of their labor will have. Each new facility of transportation developed by man has wrought great changes in his manner of living and working. Indian travois and canoe, ox cart, pack horse, Conestoga wagon, stagecoach, canal barge, steamboat, steam railroad, electric railway, motor vehicle, airplane—these words spell the progress of transportation in this country. The speed of air transportation is in as sharp contrast to the speed of our most modern surface transport facilities as these facilities were to those which they displaced.

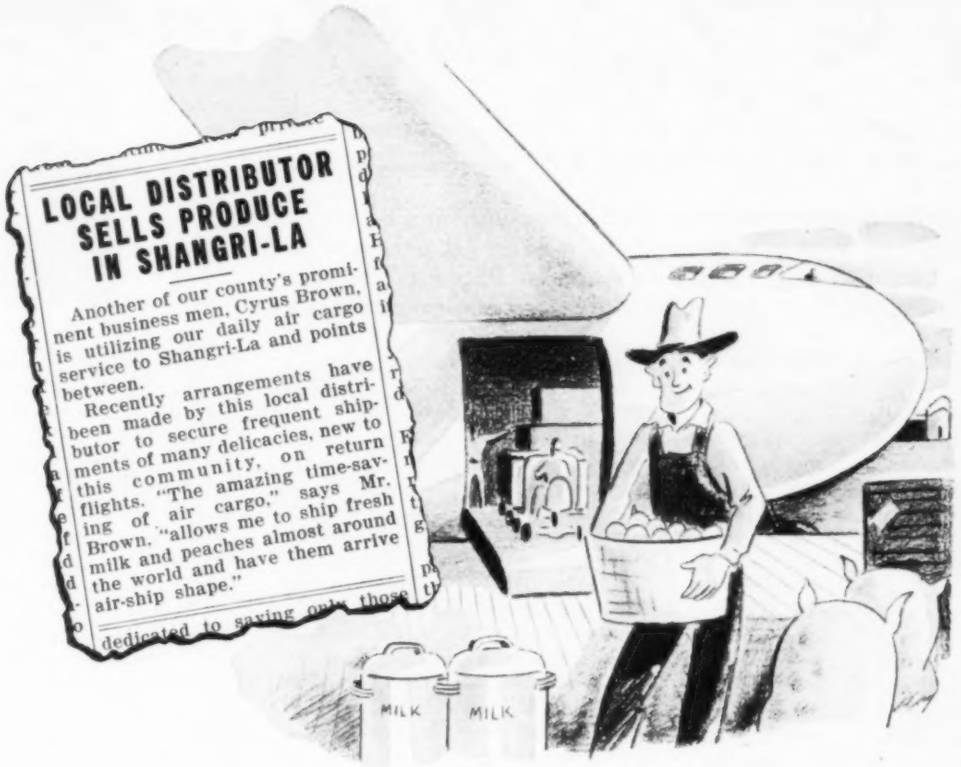
We stand today at the threshold of a new era in transportation development just as the railroads in 1850, less than ninety years ago, stood at the threshold of the great era of their development. It was then, with nine thousand miles of track, that they became a real competitor of the canals. Even in those days people did not realize the great revolution which the railroad promised to work in the economic and social life of the nation. It was only 101 years ago that the doubtlessly otherwise progressive town of Dorchester, Massachusetts, called upon its representatives in the legislature to exert their every effort "to prevent, if possible, so great a calamity to our town as must be the location of any railroad through it."

There are those skeptics today, otherwise progressive, who are blind to the certain possibilities of air transportation and the service which it is going to render to the nation and to the world. They do not realize the full force and power of the possiblities of air transportation in the postwar world. Far less are they aware of the new possibilities which will be opened up in the future by technological developments. New fuels, jet propulsion, rockets, the use of steam as a power factor, and a host of other possibilities are all being studied and developed. We are told by some that many of these things will never play a major part in air transportation, but it has not yet been forty years since man conquered the air. The ridicule of yesterday itself becomes humor for today. The end of technological development is far removed from present view. The future in the air may realize all these developments and new developments which are not now even dreamed of.

We have in this country an extensive, well-developed air-transportation system, serving on the whole all the great metropolitan centers of the nation. Rich in operating experiences, confident, full of faith in the future, this system stands ready to expand itself and to take on fresh competitive enterprise in the extension of air-transportation service to the nation and to the world.

And this expansion will take place. It will extend over the nation. It will extend over the world. It will work its changes in our daily lives. The markets and the market places of the world will be thrown together. All over the world will go the salesmen and their wares.

Merchandising by air calls for new business habits in applying old principles of profit. Every factor of capital and operating cost of the producer must be re-examined in the light of how air transportation can reduce that cost. When all new resulting costs are weighed against all the old ones, I predict that a host of things will be shipped by air in order to get there first with the best at a profit.


LOCAL DISTRIBUTOR SELLS PRODUCE IN SHANGRI-LA
Another of our county's prominent business men, Cyrus Brown, is utilizing our daily air cargo service to Shangri-La and points between.
Recently arrangements have been made by this local distributor to secure frequent shipments of many delicacies, new to this community, on return flights. "The amazing time-saving of air cargo," says Mr. Brown, "allows me to ship fresh milk and peaches almost around the world and have them arrive air-ship shape."
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In the tomorrow that is nearly today, riches of our land will be distributed around the globe—*by air!* In return, delicacies produced half a world away will become commonplace. Thus will air transportation enrich your life and your community.

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THE Sky's the Limit

BY BILL GREEN

Debunking Henry Wallace and other enemies of free industry . . . War plants can't keep over 3.3 per cent, but you can do better and fish, too . . . Plight of the small manufacturer . . . Analyzing defective engine production.

"Fascism" Rears Its Ugly Head

We note by the newspapers that Vice President Wallace is now calling someone in this country a Fascist. It makes us mad to have anyone, that somebody doesn't like, called some vague epithet like that, especially when the epithet twirlers will not mention the man's name, or what his crime is.

However, a case in point is a recently published statement to the effect that certain aircraft manufacturers were making tremendous profits. One company is alleged to have made a 135 per cent profit.

Let's take a look at that statement and make a brief analysis which you can easily verify yourself.

In the first place, if you will consult any accountant you will discover it is impossible to make even 100 per cent profit on anything. In the second place, the Army audit section, by act of Congress, is renegotiating all profits made by any company engaged in war activities, and has limited those profits to a very small percentage after deduction of taxes, etc. In the case of several companies we are personally acquainted with, this profit amounts to 3.3 per cent. In other words, no matter how much business was done, how many dollars of gross profit there were, the final amount being kept and distributed to the stockholders, was 3.3 per cent of the gross income. When you consider that you can put your money in the bank and go fishing, and still make 3.3 per cent, where the deposits are guaranteed by the Federal Government, and where you take no risks, then it seems that 3.3 per cent is not too much for people who work three shifts a day harder than they ever did, and put up with all the red tape, folderol, and hokum, normal to government contracts.

Figuring Profits

We have always had a fight with the accounting fraternity due to the fact that they like to deal in a lot of numbers which are to most accounts meaningless. For example, if you are running a business, there is one figure that carries a lot of meaning, that is, the grand total of money you take in in the course of that business. If you are selling something, then that figure is called gross sales. If you operate both a sales and service business, then that figure will be the total income. That goes at the top of the sheet. Then you have all the deductions that are necessary in the course of business. First comes the sales expense. After deducting that, there is a figure left which is sometimes called gross profits. That figure means nothing because nobody ever gets it or uses it for anything except as a base for making further deductions. Some accountants prefer then to deduct something called overhead expense. As far as we are concerned, that overhead expense is sales expense, too, but some accountants differ for very vague reasons. This overhead expense includes the rent on the building where you do business, the electric light bill, the gas bill, the water bill, stationery, printing, advertising, commissions you have to pay your salesmen, some salaries for the people who are doing the administrative or executive work, stamps, automobile expense and a host of other things that seem to be inevitable and inescapable if you run a business.

Just why those expenses should be separated from the so-called sales, or manufacturing expenses, we have never understood. You can't set a turret lathe up out in an open field and start making airplane parts. Under the present circumstances, you can't make those parts anywhere without having inspectors and inspection expense. For some reason or other, the accountants and the government hate to call that direct manufacturing expense, although they won't accept the parts without that.

Also added to this overhead expense is a little item called depreciation. A lot of people have very peculiar notions about depreciation, but it works about like this. Assume that you have a business which requires the services of one automobile. Assuming this automobile was brand new when you started out, you could expect a certain amount of service from it without any expense. Sooner or later, however, you would have to purchase some parts and have some repairs made. This you would set up as expense. Then one day, maybe two, maybe three years from now, you would have to buy a new automobile to replace that. In the meantime, of course, you would have been deducting from your income a figure which you would call depreciation, and which the government has set on automobiles at one-third of the cost of the automobile each year. This depreciation figure is an amount that you should hold in reserve against the day that you would have to purchase this new automobile. If you did not hold that amount in reserve, then on that day you had to purchase the new automobile you would not have the money with which to do it. If you did not purchase the new automobile, of course you would be out of business. You can, therefore, see that this depreciation sum is not foolishness, nor evasion, nor anything else except an admission that expense is inescapable and must be provided for.

There are certain other small items of a similar nature which have to be provided for, one of which is retooling or conversion to a different kind of business.

Puzzle of Postwar Conversion

In this connection, most businesses doing war work are doing a type of work they did not normally do. They have had to go to certain expense in order to be able to do that work. When peace comes again, they will have to reconvert their plant for the purpose of doing their normal peacetime work. Here is a concrete example. A

factory with which we are well acquainted, employed eighty men before the war. It now employs 400. In order to accommodate these extra men, extra machines were bought. In order to house the new machinery, new buildings were rented, purchased and built. Assuming that this business does not acquire additional new income over what it normally received in peacetime, it will be faced with the necessity of again reducing its personnel and its space. That means certainly, then, that if it reduces its space it will have to remove machines, set them up in a new space, sell them or store them, or something. Otherwise, it will have the problem of trying to pay more rent with the same or less income than it got in prewar years. The cost of removing these machines and setting them up in a new place or retooling, or whatever else is necessary to convert them again to the kind of work that was formerly done, can only be handled out of the money that is being made now.

Some companies have attempted to set up what they call a "postwar rehabilitation reserve." However, the Great White Father in Washington apparently does not trust American businessmen, and he has, therefore, ruled that this postwar conversion fund may not be deducted as an expense, nor may it be deducted from the company's income before renegotiation. The Army's renegotiators admit that this sum may have to be spent by the companies, but they say: "How do we know that it will be spent for that purpose!" Therefore, they will not permit its withholding. When queried as to how a small company, which has not been permitted to keep any such amount of money, can be expected to rehabilitate itself for postwar work, they say—"Well, you will have to depend upon the government for assistance." That is fine except that the people who have thus far depended upon the government in such cases, usually have found themselves holding a very big and entirely vacant sack.

Finally, from the figure that we have thus far roughed out, there comes the question of taxes which must be deducted. Gross profit is a good figure that the government must use as a base for calculating taxes. But it is not anything with which the businessman must be charged as having received as his pay for doing business. Far from it. The business man never gets the gross profit unless he perpetuates a fraud upon the government and the state. So then, what the businessman has left over is gross income, less all the money he had to pay out, less taxes, and less renegotiation if the Army decides he got too much.

A point that is easily checked is that under no circumstances is the government permitting any manufacturer of war goods to make anything anywhere near approaching an excess profit. Most manufacturers have been limited to something around 3 to 4 per cent without being permitted to retain any amount for postwar conversion. The manufacturer's own salary is checked and is not permitted to be greater than it was in peacetimes. Thus, if he pays out high salaries to his employes as an incentive for them to do more work, that money has gone and the government gets the benefit of it, and he does not. A few frauds in connection with the placing of members of the owner's own family on the payroll have been uncovered. They are definitely in the minority and not worth considering.

Anytime we see someone publish a statement to the effect that a company is making exorbitant profits, it burns us up because it seems to us to be surely propaganda of a very dark political color.

If you don't believe all this, the quickest way to prove it is to get yourself some kind of a government contract, no matter how small, and watch the thing develop.

About Faulty Engines

The newspapers have also carried items to the effect that certain large aircraft manufacturers have been delivering faulty or poor quality engines and other materials to the government.

In one of the cases it was alleged that a large engine manufacturer had delivered a good many poor quality engines which had gone to pieces and caused loss of life and property.

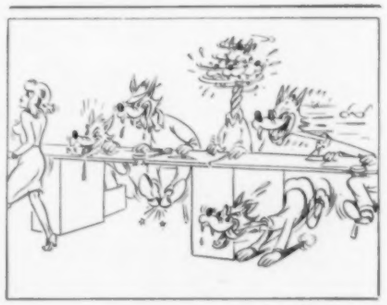
As it happened, that manufacturer is one of America's oldest and most reliable American engine manufacturers. His was the first engine that flew the Atlantic Ocean in a private plane. His was the engine that has set records for a good many years. That manufacturer is making nothing out of this war except a reputation on which he expects to cash in when peace comes again.

Why then do some of his engines go to pieces?

The thing is to our mind very simple. Some years ago, the biggest engines we had were 400 hp. About seventy-five to 100 of those horses were just colts, too, if you know what we mean. Engines were stepped up to 450 hp., then 550, then 600, then 700, 750, 900, 1,000, and so on. Each time one of those engines was souped up, there was a resultant period during which some of them failed for one reason or other, and had to be beefed up. In every case the manufacturer went to work, discovered where his weaknesses were and beefed the engine up without any outside coercion. Shortly before the war the Army was requesting certain manufacturers to develop engines of 1,500 hp. This they had a great deal of difficulty doing to the Army's specifications.

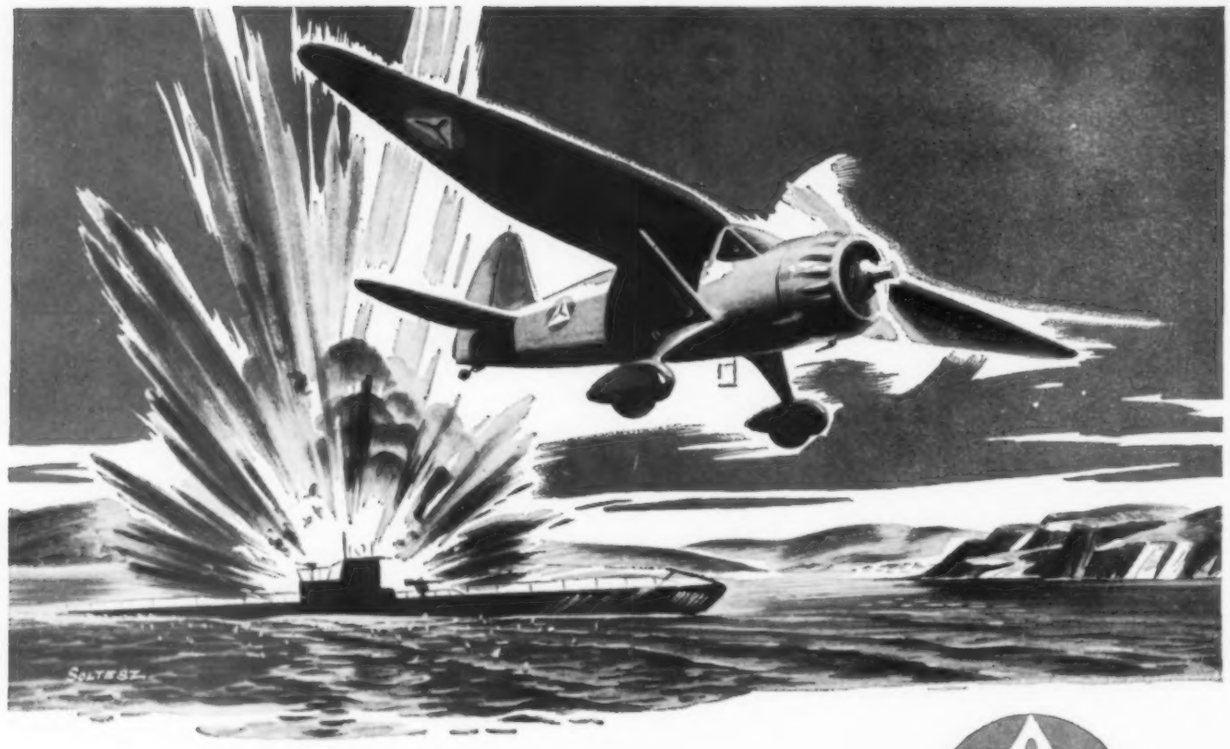
However, they did produce some 1,500 hp. engines that developed 1,250 and fell apart, but they were able to cure those shortcomings and pretty soon they were developing 2,000 hp. engines that produced 2,000 hp. and kept running. Of course, 2,000 hp. isn't enough and no telling how much will be required before it is all over. Some of the engines built by that manufacturer were supposed to be 2,400 hp. Some of those engines fell apart, some of them caught fire, etc. If they were defective it was only because they had gone beyond the normal manufacturing technique and produced something that had not heretofore been produced. You try that yourself and you will discover that it is very difficult if not almost impossible.

Another thing which is conducive to defects in production these days is the fact that the very materials that we are forced to utilize are in themselves to a certain extent defective due to the pressure and speed required by war. We have actually seen a length of chrome moly tubing which had a different hardness in each one-foot section of an eight-foot tube. When you have to build something out of such raw materials, you have to expect an occasional defective product. The marvel of it all is that as many of these engines perform as have and that the percentage of defective material and equipment has not been greater even than it has been. We think this is a tribute to all of the parties involved—the manufacturers, the inspectors, the Army and Navy inspectors, and the pilots and crews who finally utilize the equipment.



—Hughesnews.

Women in Industry



On Coastal Patrol with the CAP

Pilots of the CAP, flying many thousands of miles of over-water patrol in light land-planes, have done a magnificent job in helping to smash the wolf-packs of Nazi submarines which menaced our coastwise shipping. Simmonds-Benton Shielded Spark Plugs have played their part too, by giving dependable performance under the rigorous conditions of wartime service. The three-part, interchangeable construction of these plugs insures longer life as well as lower maintenance and operating costs. Built-in economy, plus complete reliability makes Simmonds-Bentons a "must" when you order your next set of plugs. Simmonds-Bentons will not let you down.

Lt. Jack C. Neal, CAP Coastal Patrol pilot (left) and Flight Officer Clarence C. Barrett, prior to take-off on routine anti-submarine patrol at a Gulf Coast Base. The Lycoming-powered Stinson Reliant is equipped with Simmonds-Benton Shielded Spark Plugs.

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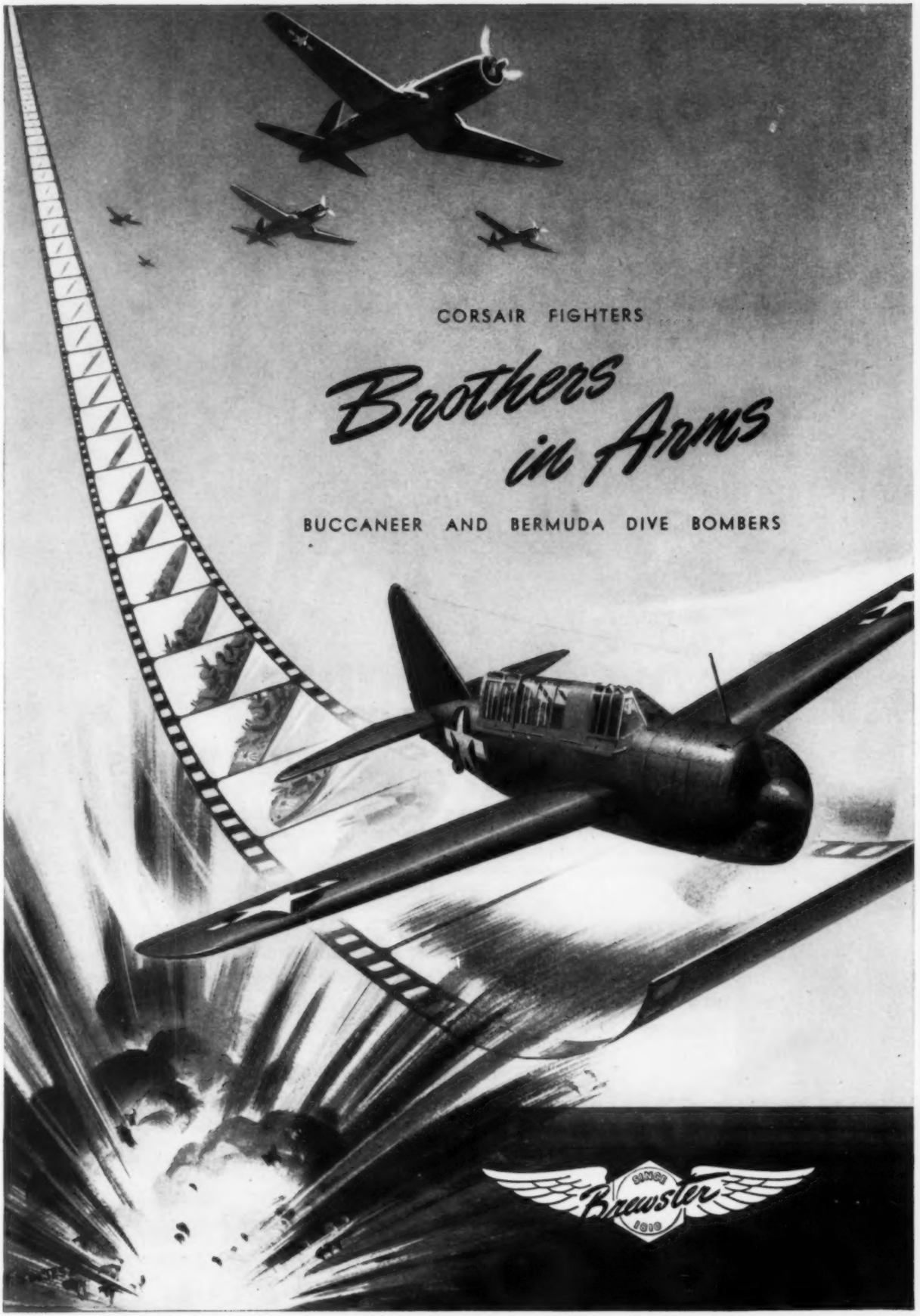
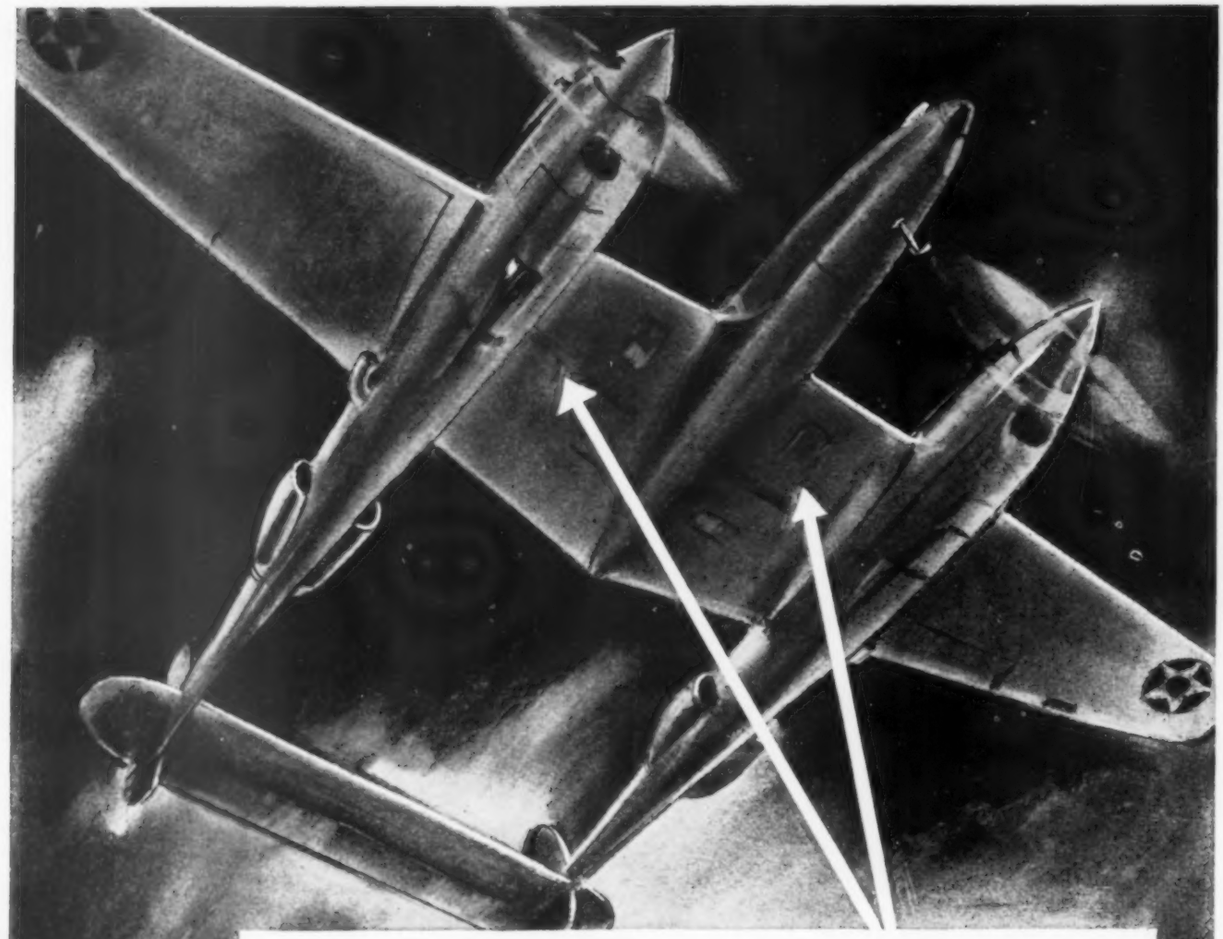

CORSAIR FIGHTERS
Brothers in Arms
BUCCANEER AND BERMUDA DIVE BOMBERS
SINCE 1919
Brewster



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American skyfighters carry an unseen companion — tanks full of 100-octane gasoline, the world's finest fighting fuel. Although they seldom see the gasoline, they are conscious of its superiority and dependability at those moments when power, climb, and speed mean the difference between life and death.

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EQUIPMENT IN WORLD-WIDE USE

Douglas C-54 cargo transports are being built in an all-timber assembly plant at Chicago, erected by the Austin Company and Army Engineers, with a saving of 30,000 tons of critical materials. The plant was designed, completed and in production in eleven months.

Eight-Press Aluminum Extrusion Mill Being Built at Memphis by Reynolds Metals Company

The Reynolds Metals Company has begun construction of a $20,000,000 aluminum extrusion mill at Memphis, Tenn., according to word received by Thomas L. Wilkes, Dallas representative, from R. S. Reynolds, president. The new mill will have eight presses and will be several times larger than the Louisville extrusion mill now in operation. The aircraft industry has been using rolled shapes due to the aluminum extrusion shortage, and the new mill will greatly alleviate this shortage. I. P. Macauley, vice president of the Reynolds Company, will be in charge of the new mill, which is scheduled for production in about six months.

Labor Crisis Mounts; Wright Says Worker Allocation Is Needed

Labor shortages in the aircraft industry during August called for immediate and decisive action, with more determined steps to replace the employment stabilization agreements worked out by the War Manpower Commission. Already in the record was the WMC plan's failure in Seattle, where Boeing as long ago as May reported a "large net loss" of hourly payroll workers every week since inauguration of the WMC stabilization program.

Director T. P. Wright of the WPB's aircraft resources control office, testifying before a Senate military affairs subcommittee, said critical labor shortages are faced in Dallas, Fort Worth, Tulsa and Oklahoma City, declaring flatly that plants in these cities will "have to have some form of allocation of labor." Under questioning, Wright said he thought it would be impossible to supply certain critical shortage areas without "compulsory manpower legislation." Sen. Austin (Vermont), who was questioning him, and Rep. Wadsworth (N. Y.) have proposed such legislation.

There are about 1,600,000 men and women workers employed in aircraft manufacture. To reach peak output in 1944, as now scheduled, the industry will have to hire 58,334 new workers monthly for the next twelve months for a total of 700,000 deemed essential, Wright told the committee. Moreover, such an increase will mean approximately 2,000,000 new workers will have to be hired to offset labor turnover. This turnover, he declared, is the "principal" problem.

While Aircraft Production Board members were touring West Coast plant areas, WPB Vice Chairman Charles E. Wilson announced the Board will do everything necessary to provide aircraft workers without delay. A series of meetings, he said, was to be held soon in Washington to shape up plans for action. Accompanying him on the tour was Frank Russell, National Aircraft War Production Council manager, and government and military officials.

Howard Aircraft Building New Ambulance for Navy

The Howard Aircraft Corp. of Chicago and St. Charles, Illinois, has taken a third prime contract for a new type of ambulance plane to be produced through the Navy's assembly line at the St. Charles plant. The company has assembly lines in operation at the new plant adjacent to the St. Charles airport.

B-24 Schedule Exceeded

Exceeding its July schedule on Liberator bombers, the Fort Worth plant of Consolidated Vultee Aircraft Corporation was commended recently by the Aircraft Production Board. For the past ten months the plant has turned out Liberators on schedule and in July exceeded its schedule, the heaviest yet assigned, George J. Newman, division manager, stated.

Parts Makers Appeal for 60-Day Draft Moratorium

Member companies of the Aircraft Parts Manufacturers Association have requested inclusion in the sixty-day draft moratorium granted prime contractors' assembly plants, stating that 124 member manufacturers are an average of 20.5 per cent behind present production schedules, despite an increase of workers during the past year of 47.5 per cent.

According to Randolph C. Walker, president of the Aircraft Accessories Corporation, Kansas City, Kansas, the percentage of their draft-age employes under twenty-five will be reduced to 7 per cent of the entire group by November. In May, 40 per cent of the draft-age men were twenty-five or under. By July, 1943, the number had been cut to 24 per cent.

7,373 Planes in July; Heavy Bomber Output Gains

Airplane production for July gained 4 per cent in numbers over June production and 4 per cent in weight, for a total production of 7,373 military airplanes, the War Production Board reported recently. Production of heavy bombers gained 13 per cent.

In announcing these figures, the WPB said: "Airplane production needs to increase still faster and reach still higher totals if the schedules for our armed forces are to be met. Production of all military goods, including airplanes, has now reached a level at which additional gains can be made only by the most determined effort. The July record in aircraft production, while not up to the high schedules set, clearly shows that the trend is definitely upward. Nevertheless, it must be emphasized that a very hard job is still ahead of us that will call for all the effort we can muster."

NAA to Hire 24,000 More Texans by Jan. 1

J. H. Kindelberger, president, announced in Dallas late in August that North American Aviation, Inc., will have to hire 24,000 additional workers before January 1 for its Texas division, which produces P-51 Mustang fighters, AT-6 Texan trainers and B-24 Liberator bombers. He also commented on installation of 1,520-hp. Rolls Royce Merlin liquid-cooled engine in the Mustang, which provides much faster speed and places the fighter in the high altitude class. The Merlin has a two-stage, two-speed supercharger.

Guiberson Triples Parts Facilities for Bomber Work

Allen Guiberson, president, has announced opening of an additional aircraft parts factory in Dallas by the Guiberson Corporation for large-scale parts fabrication for heavy bombers. The plant will employ and train 500 workers by December 1. Clyde Adams, general manager of the Guiberson Aircraft and Heater Division, will be in charge. Guiberson's existing parts facilities, serving Consolidated Vultee, Lockheed-Vega, North American, Douglas, Globe and others, will be tripled by the new operation, which will add 88,000 square feet of floor space.

C-W Income Reported

Curtiss-Wright Corporation's 1942 shipments totaled $770,594,882, an increase of 106.5 per cent over 1941 shipments and six times those of 1940, G. W. Vaughan, president of the corporation, revealed in a preliminary financial report filed with the Securities and Exchange Commission prior to final completion of renegotiation proceedings. The net income for 1942 after renegotiation, taxes and deductions for postwar reserves, amounted to $13,143,515, or a percentage of 1.706 per cent to sales. Federal income and excess profits taxes payable for the year amounted to $84,373,264, which will be reduced by a postwar refund of $7,993,000.

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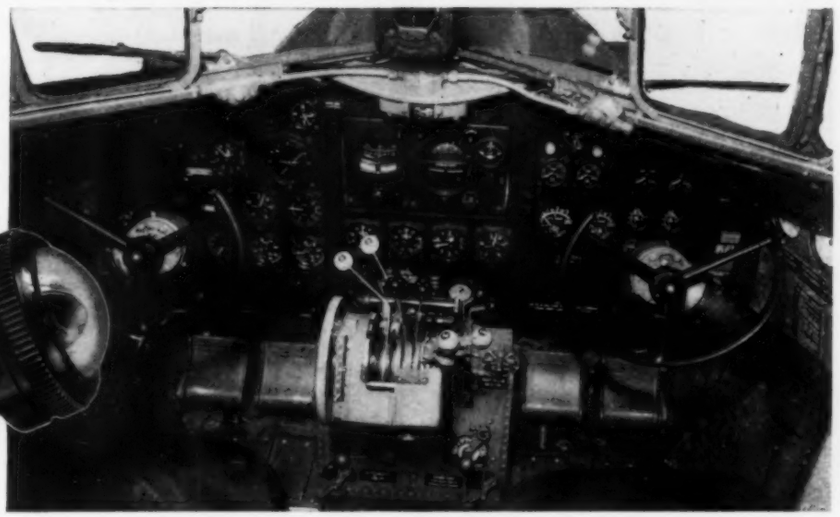

Photo illustrating typical aircraft instrument panel by courtesy of Army Air Forces Materiel Command, Wright Field.

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When electrically energized, two vanes of a fluorescent radium-active "butterfly" instantly open, showing light signal. Signalette is furnished for signals in red, amber, green or white.

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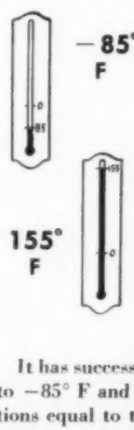

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Globe Cites Wm. Viner For Production Record

Viner

For production accomplishments in his executive capacity, William Viner, vice president, has been given special recognition by the Globe Aircraft Corporation at Ft. Worth, Texas. Tribute was paid for "performance beyond the call of duty" as supervisor of purchasing and outside production, and active participation in major steps in the production of twin-engined AT-10 advanced trainer planes Globe is building for the Army Air Forces.

John Kennedy, president and general manager, said Viner's work "played a major part in bringing Aircraft Production Board commendation to our plant for exceeding its schedule and reaching a new peak in production." Formerly in the real estate, building and investment business in Houston, Viner was one of Globe's founders.

Power-Driven Studs Save Ranger Time and Money

A new method of power-driving aircraft engine stud bolts has been put into operation at Ranger Aircraft Engines Division of Fairchild Engine and Airplane Corporation and the development has been offered to all aircraft engine manufacturers, Harold H. Budds, vice president of Fairchild and general manager of Ranger, announced recently. The stud-driving machine, twenty-one of which now drive 90 per cent of the studs at Ranger, has speeded production and saved man-hours by enabling one man to drive in one hour as many studs as formerly were driven in one day with hand tools. The initial cost of the equipment is saved every twenty-four days at present production rates, and $500,000 will be saved in the first year it is in operation, Budds declared. The power machinery, designed by Phil Kilian and Frank Lucian, Ranger production engineers, in collaboration with the Chicago Pneumatic Tool Company and Stud-Craft Associates, can also be operated by women.

New De-icer for B-24

The Liberator bomber, manufactured in Fort Worth, will be equipped with the exhaust type of anti-icer before winter, according to Tom M. Girdler, chairman of the board of Consolidated Vultee. Using exhaust gases by means of heat exchangers in the exhaust pipes, the wing and tail leading edge can be kept at 28 degrees above freezing when outside temperatures are 40 degrees below.

Safety Congress Oct. 5-7

The National Safety Congress, annual convention of members of the National Safety Council, and military, industrial and civilian safety leaders, will convene in Chicago on October 5, 6 and 7, at the Sherman, La Salle and Morrison hotels. Two new sections participating will be the Air Transport Section, with W. A. Patterson, president, United Airlines Transport Corporation, as opening speaker at its session on October 5, and the Aircraft Manufacturing Section.

General Aircraft Explains "Skyfarer" License Arrangement

General Aircraft Corporation has not been sold to Grand Rapids Industries and will build its patented Skyfarer two-control airplanes after the war when it will discontinue production of big cargo and troop-carrying gliders, H. J. Maynard, Jr., president of General Aircraft has announced. General Aircraft sold a number of G1-80 Model Skyfarers and inventory of material for this model to Grand Rapids, and granted them the right to manufacture the Skyfarer, but reserved the right to resume manufacture of the Skyfarer at any time it desires, and the agreement did not cover any other models of the Skyfarer or other General Aircraft planes, Maynard added. A second agreement with Grand Rapids granted them non-exclusive license for the use of General Aircraft patents which can be incorporated in planes designed by Grand Rapids or others. Maynard stated that General Aircraft, now in quantity production of cargo and troop-carrying gliders, plans to manufacture and market small planes for private flyers after the war.

How New Processes Save Material, Speed Output

Labor and material shortages are being met by the aircraft industry in several ways, one of which is the use of new manufacturing processes. The Aircraft Production Board of the WPB says great savings have resulted from using stampings, die-castings, permanent mold castings, centrifugal castings, welded assemblies and powder metallurgy instead of working with solid bar stock, forgings and sand castings. A material saving of 80 per cent and a cost reduction of 45 per cent was effected in stamping from sheet an engine component formerly machined from stainless steel solid bar and tubing. An aircraft ordnance part formerly machined from monel and aluminum castings is now stamped from sheet, which, with the use of ordinary tubing, will save 200,000 pounds of copper, 500,000 pounds of nickel and much aluminum, and its cost is 75 per cent lower.

Comments and suggestions on this subject are wanted and should be addressed to field representatives of AAF and Navy representatives, or to the Recorder, Operating Committee on Aircraft Materials Conservation, c/o Aeronautical Board, Room 4846, Navy Building, Washington, D. C.

Convair-Miami Changes

The Miami Division of Consolidated Vultee Aircraft Corporation has created Accounting and Product Engineering Departments, in order to make the division's departmental organization conform with that of the other ten Convair plants, W. A. Hayward, division manager, announced recently. R. W. Cole, formerly assistant treasurer, heads the Accounting Department as division controller, and A. A. Green, formerly of Vought-Sikorsky Aircraft Corporation, heads the Product Engineering Department as chief division engineer. W. S. Leaycraft continues as division treasurer and has assumed duties as chief of materials and chief of contracts.

Training for Industry

The Nashville division of Consolidated Vultee Aircraft Corporation has trained during the past two years 3,500 persons in aircraft work, sixty per cent of whom had never before been employed in industry.

6. Following are the 10 digits, which are easy to learn, and the punctuations most commonly used. There are a number of other punctuations and general signs but those here listed will suffice for all ordinary purposes.

1	.----	6	-....	Period	Error .....
2	..---	7	--...	Comma .--.-.	End of Message .-.-.
3	...--	8	---..	Semicolon -.-.-.	Ready, go ahead -.-
4	....-	9	----.	Colon ---...	Wait .-...
5	.....	0	-----	Question mark ..--..	Distress ....

7. It is harder to learn to receive than to send. Where equipment is available, a good oscillator operated by an instructor, or connected with a motor-driven device operating with a punched paper ribbon to transmit letters at various speeds, is best. Headphones are used in radio schools. But inexpensive buzzers readily obtainable at toy stores are good enough. Practice keys, operating on two flashlight batteries, are made so that with a turn of a switch they will work as a blinker or as a buzzer or will click like a telegraph. Two sets can be connected so students can send messages to each other. Operate the key by moving the forearm rather than only the wrist. In classes or with a fellow student, practice writing messages or jumbled letters and numbers sent by buzzer. They should be sent not less than 5 words per minute. Though you will miss a good many letters at the start, given combinations of dots and dashes will soon begin to mean to you the letters they represent. If the sending is too slow, these combinations will not have the right rhythm and will not sound as code actually sounds. Carry on until you can understand messages without the aid of pencil and paper.

8. Learn likewise to receive blinker messages. In emergency, improvised signaling by lights, by heliograph, or waving a handkerchief may be a matter of life or death. In wigwag signaling, a flag is held vertically on a small staff and waved in a loop to the right of the sender for a dot; to the left for a dash.

9. The above symbols are the International Code, used in cables or wireless. The original Morse, or Morse Land Code, used by American telegraphers, differs as to 11 letters and the numbers. Learning them is not required for CAP but here they are. Note that L is a long dash and there are spaces in the middle of C, O, R, Y, and Z.

1	.---	7	--...	C	.. .	Q	..-.
2	..-..	8	---..	F	.-.	R	. ..
3	...-.	9	----.	J	-..-	X	.-..
4	....-	0	—	L	—	Y	.. ..
5	---	Period	..-..-	O	. .	Z	... .
6	.....	Comma	.-.-	P	.....		

38-2B **Phonetic Alphabet** Credit 1 hour; learn by heart.

1. When trying to transmit people's initials over the phone, you have probably said "S as in Sam, F as in Frank" to avoid confusion between letters of similar sound. The Army Air Forces, in all theatres, use the following set of words for combined operations with our Allies to insure phonetic clarity in voice messages by radiotelephone:

Able	Dog	George	Jig	Mike	Peter	Sugar	Victor	Yoke
Baker	Easy	How	King	Nan	Queen	Tare	William	Zebra
Charlie	Fox	Item	Love	Oboe	Roger	Uncle	X-Ray	

e-09

16- Discharge

0. All CAP unit commanders will secure the discharge of members under their command who are wilfully inactive or whose service or conduct is unsatisfactory.

1. The following types of discharges are authorized:

1 Honorable, for members whose service has been satisfactory or not so unsatisfactory as to warrant dishonorable discharge. If satisfactory, the unit commander will endorse the member's rating sheet to that effect and may add his commendation.

2 Dishonorable, for members guilty of criminal or subversive activities or gross misconduct, whether or not in CAP uniform or on duty at the time; offenses which would cause court martial action in the Army, such as gross breaches of military discipline, disobedience of orders or neglect of duty; or actions likely to impair the discipline, morale, or operations of a CAP unit or of CAP.

2. Discharge will be effected preferably by resignation. A member may resign and be granted a discharge, subject to approval of his Wing Commander, by surrendering his identification card to his unit commander who will execute a rating sheet in duplicate and will send one copy endorsed "Resigned" and the reason and the date to Wing Headquarters with the identification card. If the Wing Commander approves he will endorse the rating sheet and send it to National Headquarters with the identification card and the duplicate of the member's application. He will notify the unit commander who will then give the member the remaining copy of the rating sheet, endorsed to show the date and reason of the resignation, the type of discharge (16-1), and the Wing Commander's approval.

1 A desirable member who has been irregular in attendance but intends to resume CAP activity later may be placed on an inactive status (15-4) in lieu of discharge if his absence has been caused by valid reasons beyond his control.

2 Resignation of a Wing or National Operations Unit Commander may be effected by letter to the National Commander subject to his approval.

3 In case of a dishonorable discharge, a resignation will not be accepted unless accompanied by a signed and notarized statement by the member acknowledging specific charges as the reason for discharge.

3. When a member whose service or conduct is unsatisfactory does not choose to resign, his discharge may be effected by a special board appointed by his unit commander, (a Squadron Commander or higher except in the case of a Detached Flight) and composed of 3 or 5 officers of the unit. A full and fair hearing, with at least 10 days notice as to the date and place, will be given. Procedures will be in general accordance with those in the Manual for Courts Martial, U. S. Army.

1 Proceedings will be initiated and charges presented by an officer, usually the unit Intelligence Officer, designated by the unit commander appointing the board. The accused member will be permitted to testify and offer witnesses and evidence on his behalf.

2 In the case of a Detached Flight, the Flight Leader, with the Assistant Flight Leader if there is one, will serve as the board and the Flight Leader may appoint a member of the Flight to present the charges.

3 The decision will be rendered in writing, with dates and particulars as to the charges against the member, and will be signed by the officers on the board. Those dissenting from the majority may append dissenting opinions. A copy of the decision will be furnished to the member and, if the decision is for discharge, the unit commander will transmit a copy to the commander of the next higher unit to whom the member may appeal within 10 days. Otherwise, the discharge will become effective after 10 days.

4 If the member appeals, the higher unit will convene a board and set a time and place to review the case under procedure as above. The member and his commanding officer may present the case either in person, by proxy, or in writing, and will be given in writing the decision of the second board which will be final. If the member is acquitted, he will continue to serve in his unit without prejudice and no record of the proceedings will be sent to higher headquarters.

5 When proceedings for discharge are completed, the member's identification card will be demanded by his commanding officer and will be sent to National Headquarters through channels with a copy of the decision or the two decisions, and a final rating sheet, endorsed to show the date and type of discharge. A copy of the rating sheet will be given to the member.

6 The procedure in this Sub-title will apply in all cases except as to the commander of a Wing or National Operations Unit. Charges against such officers may be presented to the National Commander by the Intelligence Officer of the Wing or Unit or by any three officers of the Wing or Unit staff. The National Commander may then appoint a special board of three Wing Commanders in the case of a Wing Commander or three National Operations Unit Commanders in the case of an operations unit commander. A decision will be reached as above and appeal may be taken to a board of National Officers appointed by the National Commander.

4. After the discharge of a member, if new evidence appears to show that the decision should be reversed, the unit in which the individual was a member may convene a board and recommend reinstatement by a majority vote after hearing the evidence, whereupon reinstatement can be made effective on approval of the commander of the next higher unit, or a board may be convened by the next higher unit and may direct the subordinate unit to reinstate the member. National Headquarters will then be requested through channels to return the member's identification card and the Wing file copy of his application.

5. Discharge of a provisional member may be ordered by the unit commander who will advise National Headquarters directly. If an identification card has been forwarded to the unit, it will be returned to National Headquarters through channels together with the Wing file duplicate of the application blank with notification that the application is not wanted.

6. In lieu of discharge, the unit commander may relieve the member of a functional assignment or suspend him from it. He may offer one of the following options which the member is not obliged to accept but may prefer:

1 Suspension of membership, not more than 90 days, in which case the commander will hold the member's identification card for the period.

2 Temporary demotion of one grade for not more than 90 days.

7. Disciplinary action may be undertaken by a unit commander by ordering special drill or work assignments or, in the case of an operations unit, by ordering personnel to remain on the base during periods of rest or leave.

8. The National Commander may revoke the membership of a member if official information is received as to criminal or subversive activities or of false statements on the member's enlistment application. Notice will be sent through channels to the member's unit commander who will secure the member's identification card and return it to National Headquarters through channels.

60-b

Expansion for SERVICE

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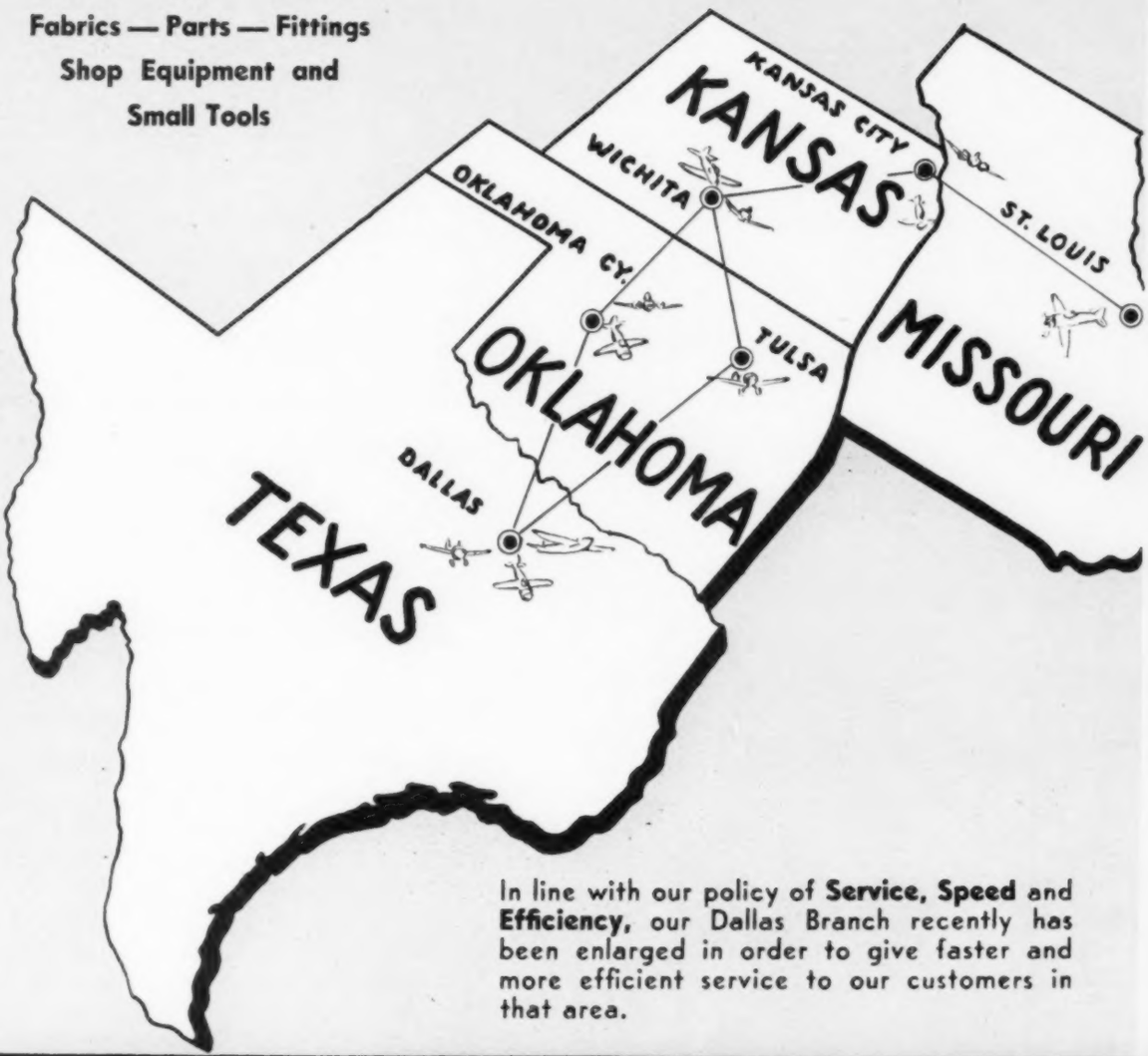

In line with our policy of **Service, Speed** and **Efficiency,** our Dallas Branch recently has been enlarged in order to give faster and more efficient service to our customers in that area.

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St. Louis, Mo. Oklahoma City, Okla. Tulsa, Okla.

FAIRFAX AIRPORT
Kansas City, Kan.

Rotary Curing Machine Devised for Propellers

A huge merry-go-round, forty feet in diameter, gives new propeller blades a ride, curing two sets of blades simultaneously, at the Connecticut plant of Hamilton Standard propellers. The outer rim of the table is flat and divided into forty-two separate slots, each of which is a sector carrying a half ton mold into which the blade fairing assembly is inserted for curing. The machine provides continuous and uniform molding of the rubber fairing with minimum handling.

Automatic Bendix "Lung" Doubles Oxygen Protection

An automatic "lung" which doubles the time flyers can remain in the substratosphere on the same amount of oxygen is now in use on the fighting front, Raymond P. Lansing, vice president of Bendix Aviation Corporation, originators of the device, announced recently. The invention, now in mass production at the Philadelphia division of the company, feeds oxygen and air to flyers at varying altitudes, and pure oxygen at extreme altitudes only as the flyer inhales, cutting off as he exhales, thus doubling the time he can remain in the substratosphere.

NEW ANTI-ICE DEVICE for propeller blades has been developed by Dr. Louis Marick of United States Rubber Company. A strip of rubber, treated with chemicals to make it a conductor of electricity, is warmed by electric current and keeps ice from forming.

Glider Output at Peak

Production of large cargo and troop-carrying gliders has reached a new high at General Aircraft Corporation's Long Island plants, and employment at the plants has been stabilized after steady monthly increases since glider operations began in May, 1942, H. J. Maynard, Jr., president, announced recently. The General Aircraft Corporation has discontinued production of airplanes and is building only the large gliders of the CG-4A type, Maynard added.

Aeronca Awarded "E"

The Aeronca Aircraft Corporation of Middletown, Ohio, recently received the Army-Navy "E" award, the first lightplane factory to receive the award of merit.

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DARNELL

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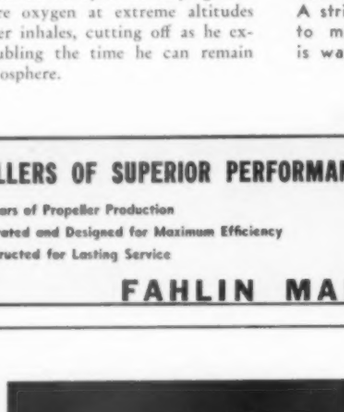

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AIRLINES . . .

American Seeks London Run; All-Cargo Schedule Launched

American Airlines, Inc., has filed application to operate transoceanic air service between New York, Boston and London, and between Chicago, Detroit, Boston and London with the Civil Aeronautics Board. The application requested Paris as the alternate terminal point in Europe, with service points in Newfoundland, Labrador and Ireland, or alternate service points in Bermuda and the Azores. The application followed the declared intentions of sixteen domestic airlines to engage in international operations.

American recently began operating daily all-cargo schedules between Los Angeles and New York via Dallas.

Atlantic Ferry Pilots Organize Airline Company

Plans for a new company, Trans-Oceanic Air Lines, Inc., organized under Captain Thomas G. Smith and a group of American and British Army pilots now engaged in transatlantic military operations, to be put in operation after the war, were revealed in a stock registration statement recently filed with the Securities and Exchange Commission.

Federal Control of Airline Liability Seen by Shadle

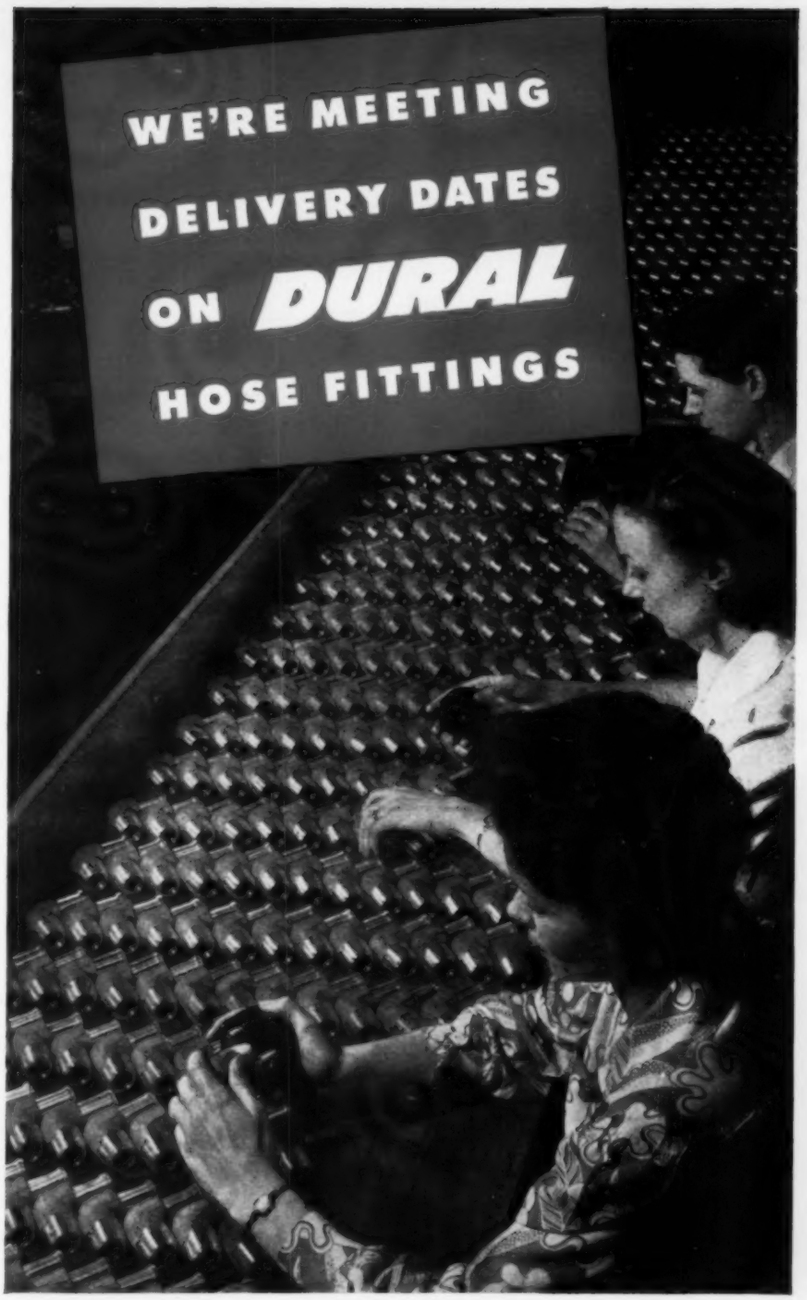
Stating that aviation cannot advance further under a mass of conflicting state laws, Webb Shadle, general counsel of the Civil Aeronautics Administration, has predicted that the federal government will assume jurisdiction over all U. S. airspace and establish uniform liability for air carriers. Shadle said it was too much to expect the states to adopt a uniform body of law to govern aviation since a uniform state sales act was submitted to the states in 1907 and only thirty states have adopted it so far. Federal establishment of uniform liability would make it unnecessary for the U. S. Government to enter aviation insurance business, but if the insurance companies did not provide satisfactory coverage, there might be self-insurance by the airlines, government subsidy or regulation of insurance companies.

Air Operations in Other Americas Show Increase

Paralleling domestic expansion plans of the U. S. air transport system is the projected enlargement of South and Latin American operations, which, in the last three years, have shown an increase of nearly 50 per cent in scheduled miles flown. Panair do Brasil seeks a direct airline connecting its Brazilian network with Miami. The CAB recently granted temporary permits for operations into Miami to TACA, KLM, Compania Nacional Cubana de Aviacion, Expreso Aereo Inter-Americano, and Lowell Yerex's British West Indian Airways.

Delta Plans Extension

The Delta Air Corporation of Atlanta has filed application with the Civil Aeronautics Board for authority to extend its operations to haul passengers, mail and express from the present home point at Atlanta to New York City as a new terminal point, by way of Asheville, N. C.; Roanoke, Va.; Washington, Baltimore and Philadelphia.



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We are manufacturing DURAL bulkhead hose fittings for pressurized cabins —AN 846, 848 and 849, and the balance of the AN 840 to 847 series.

Blueprint specifications and uniform high quality are maintained by complete inspection after each operation, and a final inspection, which checks thread tolerances and all inside and outside dimensions. Hartwell hose fittings, except those made of barstock, are pressure tested by air, under kerosene, to 100 lbs. gauge pressure.

For emergency deliveries of DURAL AN hose fittings, wire our Los Angeles office, or the branch office nearest you.

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Rick Sees Air Defeat of Germany; "Shocking" Blow at Japs Expected

The bombing of Italy will cause a "complete blowup" soon, Captain Eddie Rickenbacker said recently upon his return from a 50,000-mile tour of battlefronts as War Secretary Stimson's representative, and the German Reich will also be forced out of the war by air blasting, though not "before the fall of 1944." Rickenbacker stated it would take another year after that to defeat Japan, since the Japanese soldiers will "never give up." He insisted that Germany must be defeated "from the inside" by bombing, as any other way would be too expensive, and that the bombing of Hamburg has already cracked morale.

Saying that something may happen to shorten the war with Japan, and that he believed in miracles, Rickenbacker added that "something is coming this winter that will shock the world—maybe sooner."

Jim Rivers Joins Hughes

E. J. "Jim" Rivers, formerly works manager at Globe Aircraft Company, Fort Worth, has joined Hughes Aircraft Company, Culver City, Calif., as manufacturing superintendent in the cargo division. Rivers has been associated with the aircraft industry twenty-eight years.

AAF Reorganizes Training Command for Co-ordination

Closer co-ordination between flying and technical commanders in the same general areas is sought in a new organization plan effected by the War Department. The entire program is under the AAF Training Command, headed by Maj. Gen. Barton K. Yount, with headquarters at Fort Worth, Texas.

The three flying training centers have become "commands," with headquarters at Randolph Field, Texas, for the Central Command, Maxwell Field, Ala., for the Eastern Command, and at Santa Ana, Calif., for the Western Command. The three former technical training command districts have been consolidated into three technical commands, with headquarters at St. Louis, Denver and Greensboro, N. C., and the reorganization provides for the inactivation of the old technical training command headquarters at Knollwood Field, N. C., and of the third and fifth technical training districts at Tulsa, Okla., and Miami Beach, Fla.

In flying training, the Central Command will operate eight wing units in its area, the Eastern Command seven and the Western Command seven.

North Carolina Commission Begins Air Rules Study

The first meeting of North Carolina's newly created Aeronautics Commission was held in the office of Governor J. Melville Broughton in Raleigh on August 10. The commission, named by the governor, was authorized by the General Assembly last spring. Members are: Roy Rowe, chairman; Ben Douglas; E. C. Brooks, Jr.; William C. Olsen, and Lee H. Smith.

The commission expressed the belief that the federal government will construct a program of grants in aid to state airports, and that an agency to regulate all airways in the state was needed. Plans were considered for raising money to support such an agency.

WPB Provides Parts for Airlines, WTS and CAP

The War Production Board has set up machinery to provide essential civilian aircraft with sufficient supplies to keep them in proper repair and in operation.

This action, contained in an amendment to Preference Order P-47, permits assignment of preference ratings and allotment of controlled materials necessary for the operation of commercial air liners, planes of the War Training Service, and Civil Air Patrol aircraft.

The amendment also provides a means by which aircraft components, including controlled materials, may be directed to the operators properly entitled to receive equipment which has been set aside for them by the Aircraft Resources Control Office and the Joint Aircraft Committee. Moreover, the order has been enlarged in scope so that instead of merely covering airlines as originally, it now covers all essential civilian aircraft.

National Postwar Planning Meet to Be Held Soon

The National Aviation Training Association reports that a national meeting on postwar planning will be held soon, date and place to be set. L. Welch Pogue, chairman, Civil Aeronautics Board and of the Working Committee of the International Postwar Air Policy Group of U. S. A., who has been addressing many audiences on postwar aviation plans, will speak at the NATA convention, December 2-4, at St. Louis, on problems related to the small town.

New Aussie Fighter

The first Australian-built fighter is undergoing tests. Plans for the fighter began in February, 1942, and five months later the prototype was in the air.

Oil Reclamation Units Used In New Wright Factory

Manufactured by the Youngstown Miller Company, Sandusky, Ohio, and installed at the newest engine plant of Wright Aeronautical, are new units used in reclamation of hydraulic and other oils. These machines are two-stage filter presses, semi-automatic, thermostatically controlled, and use common refinery earths from the open market to clean the oil. Dirty oil is pumped into a heating tank under float control, filtered earth is added and after violent agitation, heat is automatically turned off and the oil emerges. It meets Air Corps specifications as to fire, flash, color, viscosity, neutralization number, etc.

NEW FIGHTER-BOMBER is this improved version of the Douglas A-20 Havoc. The silhouette shows four cannon mounted in the nose. This and other versions of the A-20 are said by Douglas to be abroad in "greater numbers than any other U. S. warplane."

New WTS Quotas Soon

War Training Service operators from whom students have been withdrawn for transfer from the enlisted reserves to active military duty status have been told by the CAA that new monthly quotas will be forthcoming during September and early October. Withdrawals started in earnest on July 20, and by late August some schools had only two or three students left out of seventy or eighty. New quota arrivals, it is said, will have been placed on active military duty status before reaching the schools.

Separate Air Force Up to FDR; Marshall Said to Favor Independence

An independent air force and the creation of a chief of staff for air are provided in a directive recently placed on President Roosevelt's desk, according to American Aviation Daily. Comments of Army chiefs which accompany the directive reflect a wide range of opinion, although it was said General George Marshall favors the step.

NAA Earnings Revised

North American Aviation, Inc., reported a reduction of annual net income from $10,436 413.46, a 4.3 per cent of sales, previously reported for the fiscal year ending September 30, 1942, to $7,370,626.31, or 2.91 per cent of sales, in a revised financial report following renegotiation of Army Air Forces contracts. The revised report of airplane and parts sales showed an increase from $242,595,085.61, previously reported, to $253,226,119.02, the increase resulting from adjustments previously credited to cost of sales and increase in receivable accounts for the government not yet signed when books closed on September 30, 1942. Bank credit in the amount of $75,000,000 has been arranged under a V-Loan, the company stated.

Cannon Gets "E"

The Cannon Electric Development Company, Los Angeles, manufacturers of electrical cable connectors for aircraft, sound, radio and other signal equipment, was recently awarded the Army-Navy "E".

CAP Women Authorized to Wear WAC Uniform with Modified Features

Women members of the Civil Air Patrol have been granted the privilege of wearing the WAC uniform with the special CAP insignia and distinguishing features according to National Headquarters. This arrangement was recently approved by the Army Adjutant General and by Col. Oveta Culp Hobby, commandant of the WAC's. Sale of the WAC uniform to CAP female members is to be authorized, and purchases should not be made until the CAP National Headquarters Supply Office issues a directive on the subject. WAC buttons and insignia will be removed from the garments before sale and will be replaced by CAP silver buttons and insignia including the CAP red shoulder loops, red braid and shoulder emblem. The WAC cap will not be worn. CAP women will continue to wear garrison (overseas) caps and service caps as before. The WAC skirt will not be worn by girls in the CAP Cadets. For them the khaki skirt is the proper wear.

New York Wing Holds Well-Attended Conference

The New York State CAP Wing held a two-day conference July 31-August 1 at the Syracuse Hotel, Syracuse, N. Y., with the 3rd Group of Syracuse as hosts. The conference, the first of its kind, was attended by 500 members from New York and adjoining states. Conference speakers included Lt. Col. Earle Johnson, AC, national commander; Lt. Col. Edward C. O. Thomas; Major A. E. Taube, AC, Commandant, Turner Field, Ga.; Major Stuart Welch, CAP, Commanding N. Y. Wing; Captain Leslie A. Bryan, CAP, Commanding 3rd Group, N. Y.; Mayor Thomas E. Kennedy, Syracuse; and Lt. E. R. Vadeboncoeur, CAP, 3rd Group Intelligence Officer.

An attractive program of the conference, prepared by Sgt. Helen F. Graley, 3rd Group, contained photographs of CAP National, New York Wing and Group officers, a history of the Civil Air Patrol and of the 3rd Group, an account and pictures of the CAP Cadets, Syracuse Municipal Airport and Canastota Airport, Syracuse, as well as the schedule of conference meetings and dinner menus.

South Dakota Continues Impressive Courier Feat

Recapitulation of figures for July shows the South Dakota Wing's CAP Courier Service completed 100 per cent of scheduled flights during that month, carrying over 24,000 pounds of cargo and flying over 76,000 miles.

During the first two weeks of August, the Wing's nine Courier planes, operating under the Second Air Force, flew a total of 35,410 miles in 534 hours and carried 9,911½ pounds of cargo and 157 pouches of mail. Only one of 105 scheduled flights was canceled out.

South Dakota Wing planes have rolled up a total mileage so far of more than 300,000 miles without mishap.

Because of these accomplishments and the high value of such service to the Army, it is believed expansion of Courier Service in other sections of the country will soon be effected.

Colorado Pilot Chalks Up Second Mercy Hop

Lt. Norman Kramer, the CAP pilot who dropped supplies last November to an Army plane crew stranded atop Baldy Peak, New Mexico, has accomplished another mercy mission. The Alamosa, Colo., squadron commander recently flew across the mountains to carry a nine-year old LaJara youth to a Denver hospital for an emergency brain operation. Electrical storms and rain failed to deter him.

How-to-Fly Film Available

A series of films on how to fly have been produced by the Bray Pictures Corp., of New York City, and will be available in September, for use in preflight training at schools, colleges, universities. They show in detail the entire movements of a Piper Cub trainer and pilot from take-off to landing. Dr. Arthur S. Otis, co-author of text book, "Elements of Aeronautics", was technical advisor on educational procedure.

We See by the Papers—

Canton, Ohio—"A" card holders around McKinley airport are telling this story and wondering whether the Army Air Corps has heard about America's gasoline shortage.

A nearby war plant called on Canton's Civil Air Patrol courier service for a light plane to rush a 30-pound piece of tubing to Patterson Field at Dayton. As the Civil Patrol pilot was preparing to take off from McKinley airport, the war plant canceled the flight, explaining the Army would send a plane to Canton to pick up the tubing. About noon a big twin-motored, 21-passenger Army transport with a crew of three swooped down to pick up the 30-pound piece of tubing. Airport attendants said the Army men were somewhat astonished when they saw their light-weight cargo. Pilots at the field said the Civil Air Patrol plane would have required 20 gallons of gasoline for the round trip. They estimated the big Army ship used 200 gallons! To save you figuring, the wasted gasoline would have supplied an "A" card holder with gasoline for eleven months!

LIGHT, COMPACT, COLLAPSIBLE SAILING RIG, made of anodized aluminum short sections hinged together with a locking device, has been developed by CAP members for use on rubber life rafts. The rig consists of a sectional mast mounted at the front or bow of the boat and arranged so it can be hinged forward or backward. Safety equipment, such as center boards, a steering rudder and a marine type of compass, have been provided. The whole rig will float and the parts are tied together so they can not be lost from the raft or each other.

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New factory stocks. Our Specials: 6.00x6 non-skid 7.00x4. 8.00x4 smooth 2-ply $8.75. 4-ply $10.75. Tubes $3.25. Large stock 6.50x10, 7.50x10, 8.50x10, Culver 5.00x4, new production 4-6 ply, 8"-10" and all sizes tail wheel tires. New Goodrich 6x2 solids $1.45. Big stock Tires, Propellers, Spark Plugs, and Batteries. Rush delivery in any size, supplying many of the largest operators at lowest prices. Shipment C. O. D. Inspection allowed, guaranteed merchandise.

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BOB TRADER AERO SUPPLY

Municipal Airport, Pittsburgh, Penna.

CAPTAIN SIDNEY OLIVER, instructor in assembling and use of firearms, teaches CAP members of Squadron 2, Headquarters Group, Arkansas Wing, in the use of shotguns and revolvers. Left to right, are: Captain Oliver, Pvt. Harold J. Medlock, Pvt. Thermon B. Smith and Pvt. Helen James. During a recent blackout, members of Squadron 1 and 2, Headquarters Group, furnished an armed guard of 25 men and women to patrol the Little Rock municipal hangar, administration building, and airfield.

Change in Credentials

Issuance soon by National Headquarters of new identification cards will place another obstacle before inactive CAP members, who will then have to get busy and qualify for the new credentials or lose their status. Procedure for obtaining the new cards will be announced as soon as they are available.

CAP Leaders Active in Pennsylvania Air Planning

The new Pennsylvania State Aeronautics Commission, authorized by the 1943 state legislature, made plans for an all-state aviation conference at their first meeting in August. The conference, date of which will be announced later, will be devoted to plans for postwar development of aviation in Pennsylvania. The Commission, members of which were named by Governor Edward Martin, adopted a $213,000 budget for the biennium and directed Major William L. Anderson, Wing Commander of the Pennsylvania CAP, to prepare a plan for leasing state-owned airports to commercial operators. Members of the commission are: Major Anderson, CAP; Major Ralph Earle, CAP; John Henry Leh; Dr. Ralph Cooper Hutchinson and Floyd Chalfant, chairman.

Bartholomew Heads Oklahoma Branch of Supply Division, Inc.

A new branch of Supply Division, Inc., Lambert Airport, Robertson, Mo., wholesale aeronautical suppliers, has been opened in Oklahoma City under the management of Fred M. Bartholomew. The new unit will serve as a central source of accessory and engine part supplies to dealers in the Southwest territory. Supply Division, Inc., which has operated for ten years in Missouri, is a "warehouse annex" to dealers throughout the country, supplying all types of accessories and engine parts and shipping by air express when required.

Bartholomew has been in the aviation business for the last ten years, obtaining his pilot license in 1933. He formerly was associated with Aviation Credit Corp. of St. Louis as sales manager and later as general manager of their training division, War Training Service. He has had distributorships in Missouri, Kansas and Illinois for Stinson and Culver airplanes since 1933.

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BENDIX SCINTILLA

Meacham Field — Fort Worth, Texas

By TONY HAGMANN ★ Field Representative

Dallas, Texas—This department was getting ready to scream like a panther at the dearth of news around Dallas, so we wound up the bucket of bolts and rattled out to White Rock to look over the situation.

Seems that "Test Pilot" Thompson was reported to have been doing some more work with a P-38 . . . goodie goodie! Then we listened in on a hot and heavy discussion between Andy Muse, G. E. "Fossil" Robertson, Leslie Rose and Wm. McComas about the B-25's and the Shangri-La deal. It was decided that "could be".

Nickey Naumovich signed up for arrival with passenger R. L. Rose from Terrell, while "Chocolate Soda Mac" held down the coke sales . . . Saw M. S. Norwood, Curtis Parker, Pappy Reeves, Hink Hinkley.

News of an ole Texas Private Pilot now in the Ferrying Command makes us very proud for him. Lt. Otto M. Velhe is stationed in Nashville, Tenn. He has been checked out on the heavy stuff and made a foreign trip, and sends his regards to the gang. We wonder where some of the others are?

Ole Bill Piper came through town; so did Jimmy Mattern, who had Capt. Tommy Lanphier in tow. The Captain holds ribbons, stars, clusters and such for heroic work in the Pacific. "Doc" Geo. R. Clay came in and said Howdy.

Any day you don't have a thing to do, please sit down and drop us a note, or the Editor will cut the hen out of this department and we will have no Ports of Call at all. That would be a foul thing to happen, so come on . . . get hot on that pencil department.

From Kansas City, Missouri, and Marion Melcher, we hear:

Among our handsome natives, "Pat" Flannery has been commissioned a First Lieutenant in the Army and reported to Sherman Field. Flannery, often referred to as the "Flying Circuit Clerk", has been a pilot since 1926, and operates the Missouri-Kansas Aviation service at the Municipal Airport.

The CAP Squadron on the airport is training the first group of 16-year-old cadets. These free courses are designed to enable boys to pass the entrance exams of the Army Air Forces when called into service . . . Aviation commissioner of the C. of C., Richard C. Murray, attended the Oklahoma Aviation conference at Oklahoma City, combining this with a study of the NAA chapter's activities and investigating air youth activity in the public schools and the Boy Scout Aviation program while in the capital.

The Kansas City Unit of the Women's National Aeronautical Association forgot heat in the air-conditioned Hotel Phillips and had "Chet" Roskam, special representative of the Outside Production Department of Beech Aircraft in Wichita, as speaker for the August dinner meeting with three other Beech representatives at the head table: Ted Kuhn, Bill Fugit and Nyle Mickley. Aside from smaller projects—such as collecting junk jewelry for the boys in the Pacific islands, who use it for barter purposes, and supplying cigarettes for the Service Men's Club—the Unit has undertaken to furnish the ready room for the pilots of the 2nd Ferrying Squadron based on Fairfax Airport. Lt. Col. Wm. J. Fry, commanding officer, met with the Unit's committee on August 20th. Among those present was the Squadron's mascot, a mountain lion cub, who is still young enough to make you think of a huge kitten, so your reporter picked him up. He is not a kitten! Those meaningful teeth of his clamped on the shoulder padding of my suit—and Allah be praised for the padding.

'Bye now.

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